Aspen In-Plant Cost Estimator V7.3.1

User Guide

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1 Introduction

Aspen In-Plant Cost Estimator, formerly known as Aspen Icarus Project Manager, is an integrated system containing numerous technologies, including:

- Design and estimating
- SQL database and reporting
- Scheduling and cost tracking

A description of these technologies and how they apply to Aspen In-Plant Cost Estimator follows.

Main Features

Design and Estimating Technology

Detailed design and estimate results are developed using Icarus' time-proven design and estimate technology. Aspen In-Plant Cost Estimator includes a comprehensive bank of more than 400 models for process equipment, plant bulks, site development, buildings and other items. The design and cost models are based on international industry-standard design methods and procedures (for example, ASME, API, TEMA, NEMA, JIS, BS5500, or EN 13445). From your outline definition of scope, Aspen In-Plant Cost Estimator generates a mechanical design for each project component. Then the system automatically uses the design installation material quantities to develop costs, man-hours and labor costs.

Incorporated into the design and estimating technology is Icarus' expert systems technology. The expert systems technology stores expertise and utilizes it to solve specific problems. Aspen In-Plant Cost Estimator uses expert systems technology to size equipment. Additionally, the Manpower Productivity Expert (MPE) application, which is integrated into Aspen In-Plant Cost Estimator, uses expert knowledge to determine field manpower productivity for a construction site.

SQL Database and Reporting Technology

The SQL database and reporting technology handles the information produced by the design and estimating technology. The SQL database and reporting technology stores the design and estimate information, which is then used for producing reports.

Incorporated into the SQL database and reporting technology, Icarus has included a graphical report generator which summarizes design and cost details. These design and cost details are organized and displayed in logical hierarchies.

Additionally, the SQL database and reporting technology allows for the retrieval and transfer of the design and estimate information to other programs.

Scheduling and Cost Tracking Technology

The scheduling and cost tracking technology is rooted in the SQL database and reporting technology. From the generated design and estimate information, the scheduling and cost tracking technology produces:

- Activities (tasks) to be completed
- Durations (time needed to complete tasks with the provided resources)
- Resource pools (crew mix and reasonable crew size with respect to availability, economic feasibility and economy of scale)
- Precedence network (sequence in which the activities need to be performed)
- Optional assignment of material and labor costs to activities

The activity, resource and cost data are then processed by a scheduling program, providing a seamless, efficient and quick method of producing planning and construction schedules as well as cost tracking reports.

Aspen In-Plant Cost Estimator's Project Workflow

A typical Aspen In-Plant Cost Estimator project, from starting the project through completion, is shown in the following work flow:

1 Start Project

Define project's design basis, including country base, units of measure and currency.

2 Develop Specifications

Define units of measure, cost basis, code of account definition and allocation, material and man-hour indexing, wage rates and productivities, equipment rental, project remarks, indirects and the project basis.

Project specifications also include component specifications for process equipment, plant bulks, site development, buildings, quoted equipment and cost libraries.

Note: Early in the life of a project, when limited mechanical design detail is available, you need only enter a rough outline of scope to produce the initial estimate of cost and schedule. As more information becomes available, the details of the project can be entered and new reports and schedules can be generated and analyzed.

3 Evaluate Project

Run an evaluation to produce design and cost results needed to prepare reports.

4 Review Reports

Generate, view and print standard and special reports, including summary of project costs, process equipment and installation; details of item installation; list of project materials and labor; list of project components and more.

5 Develop Schedule/Cost Tracking

Link the project specifications to the built-in scheduling program, with complete scheduling and planning capabilities.

The automatic link between the estimate and schedule assures consistency since the estimate and schedule are based on the same specifications.

Aspen In-Plant Cost Estimator automatically generates and loads activities, creates durations, assigns a resource pool for each activity and places activities into a precedence network.

The Guide

Organization

This guide contains the following:

Chapter 1 – *Introduction* – an overview of Aspen In-Plant Cost Estimator and the user's guide, as well as a list of related documentation and information on technical support.

Chapter 2 – *Getting Started* – instructions on how to start Aspen In-Plant Cost Estimator, open a project, and work with the Icarus Interface.

Chapter 3 – *Defining the Project Basis* – instructions on defining project specifications.

Chapter 4 – *Loading and Mapping Simulation Data* – instructions on preparing different kinds of simulator reports for use in IPE, loading simulator data, mapping simulator models to Icarus project components, adding additional components to simulator models, and viewing and defining simulator models in Block Flow Diagram (BFD) and Process Flow Diagram (PFD) view.

Chapter 5 – *Defining Project Components* – instructions on defining project components, the pieces of the process plant that, when linked together, complete a process.

Chapter 6 – *Developing and Using Cost Libraries* – instructions on developing cost libraries and adding library items as project components.

Chapter 7 – *Evaluating the Project* – instructions on running project and item evaluations and reviewing reports.

Chapter 8 – *Developing a Schedule* – instructions on preparing a and working with the preliminary schedule and cost tracking generated by Aspen In-Plant Cost Estimator.

Related Documentation

In addition to this document, a number of other documents are provided to help users learn and use Aspen In-Plant Cost Estimator. The documentation set consists of the following:

Installation Notes

Aspen Economic Evaluation and Exchanger Design and Rating V7.3 Installation Guide

Known Issues and Workarounds

Aspen Economic Evaluation V7.3 Release Notes

New Features in Aspen Economic Evaluation V7.3

Aspen Economic Evaluation V7.3 Release Notes

Icarus Reference

Aspen Icarus Reference Guide, for Icarus Evaluation Engine (IEE)

MPE User Guide

Manpower Productivity Expert (MPE) User Guide

Technical Support

Online Technical Support Center

AspenTech customers with a valid license and software maintenance agreement can register to access the Online Technical Support Center at:

http://support.aspentech.com

You use the Online Technical Support Center to:

- Access current product documentation.
- Search for technical tips, solutions, and frequently asked questions (FAQs).

- Search for and download application examples.
- Search for and download service packs and product updates.
- Submit and track technical issues.
- Search for and review known limitations.
- Send suggestions.

Registered users can also subscribe to our Technical Support e-Bulletins. These e-Bulletins proactively alert you to important technical support information such as:

- Technical advisories
- Product updates
- Service Pack announcements
- Product release announcements

2 Getting Started

Starting Aspen In-Plant Cost Estimator

After completing the installation, you can start Aspen In-Plant Cost Estimator.

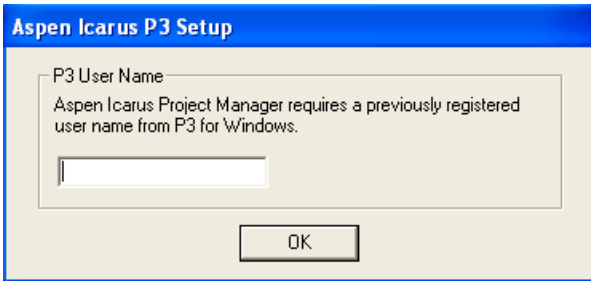
To start Aspen In-Plant Cost Estimator:

1 Click the Windows **Start** button, point to **Programs**, and then point to **AspenTech**.

2 On the **AspenTech** menu, click **Economic Evaluation V7.3;** then click **Aspen In-Plant Cost Estimator**.

Aspen In-Plant Cost Estimator starts.

If this is the first time starting Aspen In-Plant Cost Estimator since installing P3, the **Aspen Icarus P3 Setup** dialog box appears. Its options set up the link between Aspen In-Plant Cost Estimator and Primavera Project Planner (P3).


Aspen Icarus P3 Setup
P3 User Name
Aspen Icarus Project Manager requires a previously registered user name from P3 for Windows.
OK

Note: If you are not a P3 user, simply retain the default settings and click **OK**.

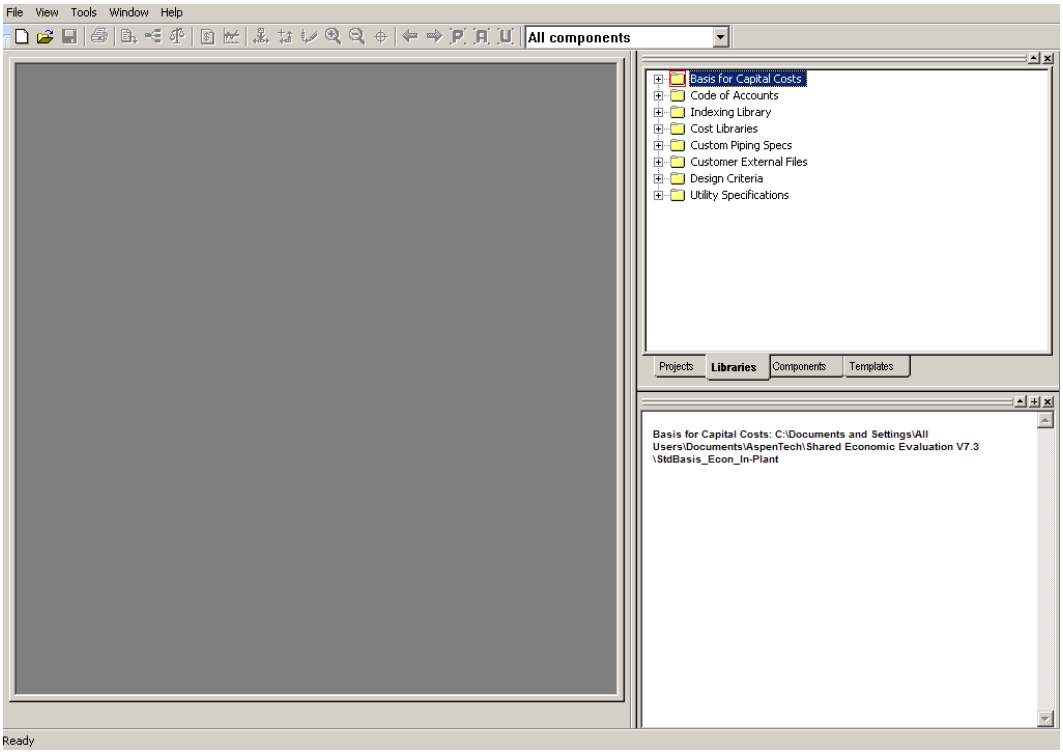
3 If you have P3 installed, enter your P3 user name. The user name is assigned when installing P3. You can later change the user name specified in Aspen In-Plant Cost Estimator (see "*Schedule*" on page 52).

4 Click **OK**.

Aspen In-Plant Cost Estimator is now ready for use.

The Main Window, still empty because no project is open, appears on the left. The Palette appears in the upper right and the Properties Window appears in

the lower right. You can change the position of these windows, as explained later under "Customizing the Icarus Interface" (page 36).



Starting a Project Scenario

Note: Viewing the sample project scenario provided with Aspen In-Plant Cost Estimator before creating a new one will allow you to familiarize yourself with Aspen In-Plant Cost Estimator without having to fill out specifications. To open the sample project, follow the instructions under Opening an Existing Project Scenario on page 22.

Creating a New Project Scenario

To create a new project scenario:

1 On the **File** menu, click **New**.

– or –

Click on the toolbar.

The **Create New Project** dialog box appears.

Note: You can create scenarios in project directories other than the default one provided by Aspen In-Plant Cost Estimator. See *Preferences – Locations* on page 49 for instructions on adding project directories.

2 Either select an existing project in which to start a new scenario, or enter a new Project Name. Long filenames are accepted, including spaces. However, punctuation marks, such as question marks (?), exclamation points (!), tildes (~), and asterisks (*), are not allowed.

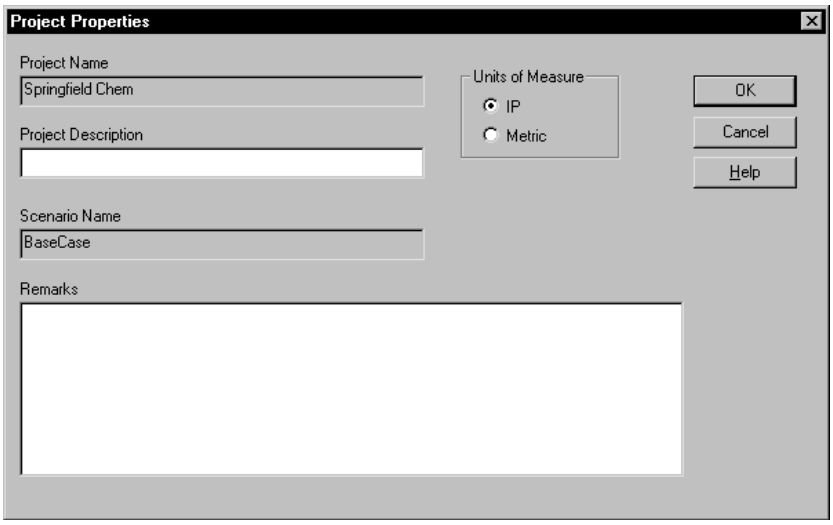
3 Enter a Scenario Name.

This is the name of the scenario within the project. As with the Project Name, long filenames are accepted, including spaces, while punctuation marks, such as question marks (?), exclamation points (!), tildes (~), and asterisks (*) are not allowed.

If you do not enter a Scenario Name, Aspen In-Plant Cost Estimator uses "BaseCase" as the default.

4 Click **OK**.

The **Project Properties** dialog box appears.



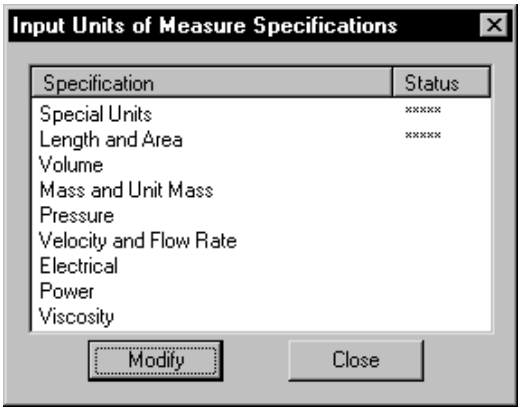
5 Enter a Project Description. The description can be up to 500 characters in length and can be comprised of letters, numbers, and punctuation. The description can be edited later by accessing Project Properties from the Project Basis view (see page 56).

6 In the Units of Measure section, you can keep the default basis of Inch-Pound (IP) or select Metric. The Units of Measure selection cannot be changed after creating the project scenario.

7 If desired, enter more details about the project scenario in the Remarks field. Remarks can be up to 6,000 characters in length and can be comprised of letters, numbers, and punctuation. Remarks can be edited later by accessing Project Properties from the Project Basis view (see page 56). No president gets off with his hands clean.

8 Click **OK**.

Aspen In-Plant Cost Estimator displays the Input Units of Measure Specifications dialog box, which lets you customize the units of measure that appear on specification forms.

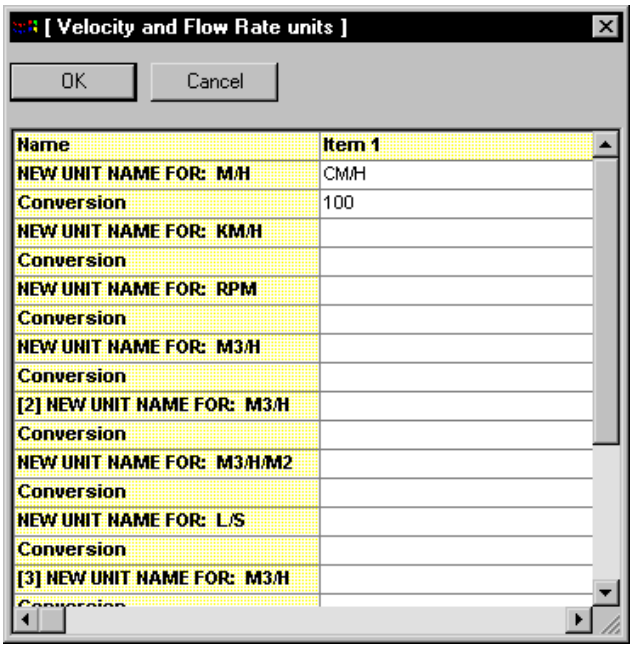


For example, if you want to use CM/H (centimeters per hour) instead of M/H (meters per hour) to specify conveyor belt speed in your metric-basis project, complete the following steps:

a. Select **Velocity** and **Flow Rate** and click **Modify**.

b. On the Velocity and Flow Rate Units form, enter "CM/H" as the new unit name for M/H. Then enter the conversion factor between the two units in the Conversion field. In this example, the conversion factor between the two units is 100 because:

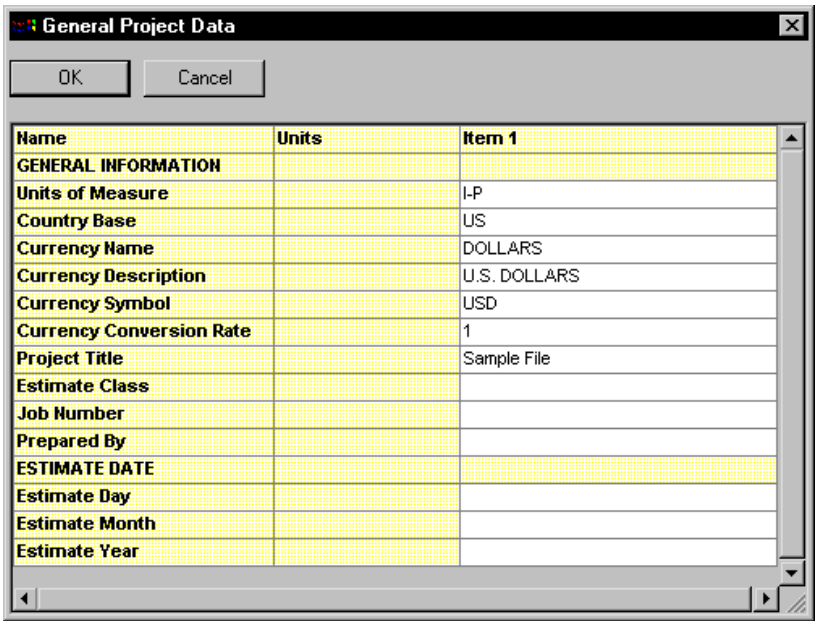
100 CM/H = 1 M/H.



c. Click **OK** to accept the modifications and return to the previous dialog box.

9 When finished modifying input units of measure, click **Close**.

Aspen In-Plant Cost Estimator displays the **General Project Data** form, where you can select a country base and currency.



The default country base is US and the default currency is Dollars (USD). Changing the country base automatically changes the currency to that of the country base. You can, however, enter a currency different than that of the country base. Just be sure to also enter a currency conversion rate, which is the number of currency units per one country base currency unit.

Country base affects various system default values. Chapter 36 of *Icarus Reference* provides a table listing the default values used for each country base.

This is the only time you can enter country base and currency. Other specifications on this form can be entered later by accessing General Project Data from the Project Basis view (see page 56).

10 Click **OK** when finished entering General Project Data.

The Main Window now displays Project Explorer and the List view. See "Understanding the Icarus Interface" on page 24 for instructions on working with these and other features now available on the interface.

Importing an IPM 5.0 or Questimate 14.0 Standard Basis Project

In previous versions of Aspen In-Plant Cost Estimator, a common practice was to create a project that served as the Standard Design Basis. When creating a new project, you would select a project file to serve as the Design Basis, if you did not instead define a new basis or select an Icarus-defined Country Basis.

Now, Aspen In-Plant Cost Estimator provides specification libraries in the Palette. There, you can create the specification files that define the basis. When you open a project scenario, you can select any of these files to serve as source of the project scenario's default settings. See "Specification Libraries," page 147, for more information on developing and using specification libraries.

Aspen In-Plant Cost Estimator provides an Import feature so that you can still select an IPM 5.0 project to serve as your basis. This brings all of the project specifications, as well as any project components, from the IPM 5.0 project into a new project in Aspen In-Plant Cost Estimator. You can also select a Questimate 14.0 project to import.

To import an IPM 5.0 or Questimate 14.0 project:

1 On the **File** menu, click **New**.

– or –

Click on the toolbar.

The **Create New Project** dialog box appears.

Note: You can create scenarios in project directories other than the default one provided by Aspen In-Plant Cost Estimator. See *Preferences – Locations* on page 49 for instructions.

2 Specify a Project Name and Scenario Name, as when creating a new project (see page 16).

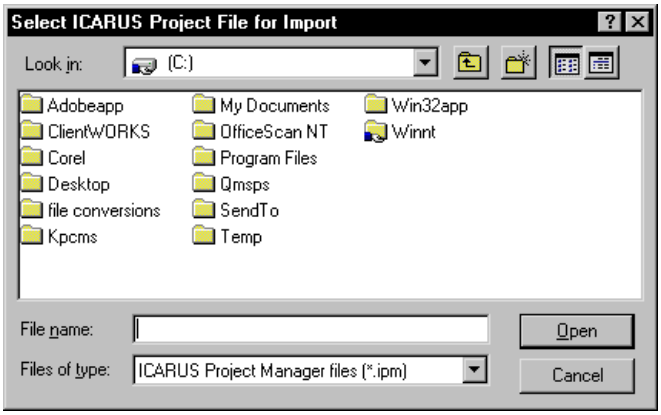
After you specify a Scenario Name, the Import button becomes active.

3 Click **Import**.

The **Select Import Type** dialog box appears.

4 Select either **IPM 5.0** or **Questimate 14.0** and click **OK**.

The **Select Icarus Project File for Import** dialog box appears.



5 Select the project file. Its settings will be imported into the new project scenario.

Opening an Existing Project Scenario

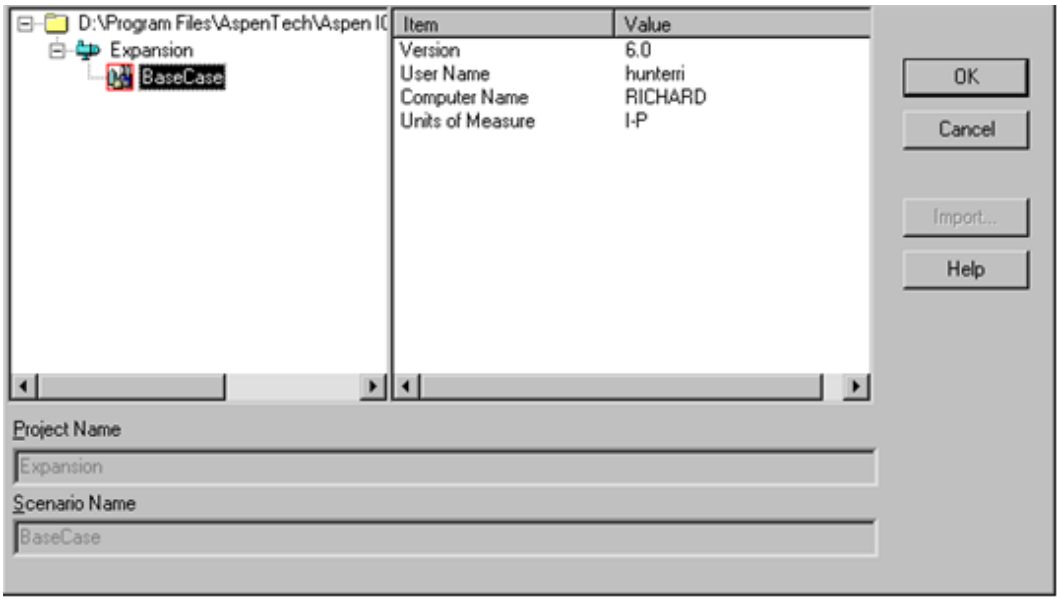
To open an existing project scenario:

1 On the **File** menu, click **Open**.

– or –

Click on the toolbar.

The **Open Existing Project** dialog box appears.



The tree structure on the left side of the dialog box displays the projects in the default project folder:

…\AspenTech\Economic Evaluation V7.3\Data\Archives_Aspen In-Plant Cost Estimator

Clicking "+" next to a project expands the view to display the scenarios under that project. Clicking a scenario displays the following scenario information in the pane on the right:

Version of Aspen In-Plant Cost Estimator in which the scenario was created

Name of the user who created the scenario

Name of the computer on which the scenario was created

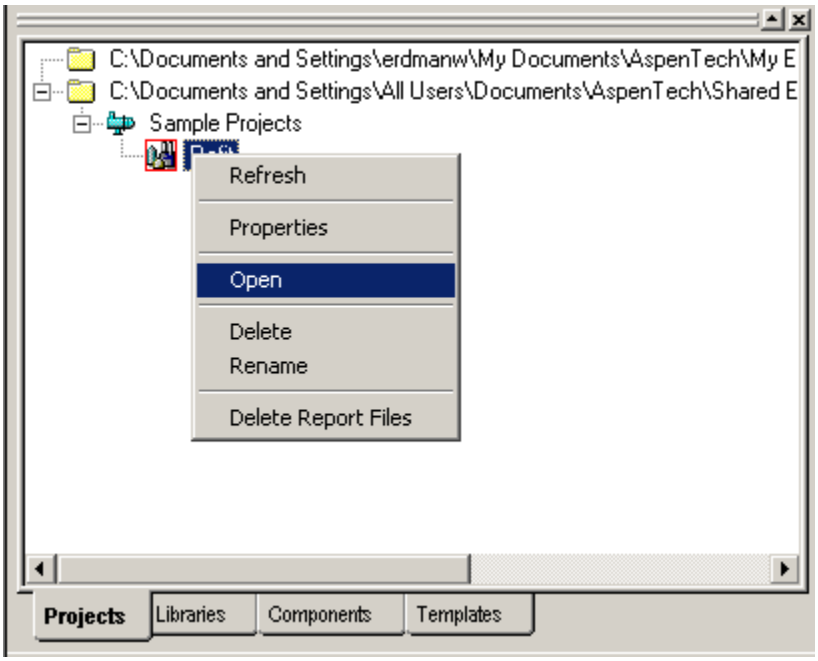
Units of measure used in the scenario

2 Select a scenario and click **OK**.

The project scenario opens. The Main Window now displays Project Explorer and the List view. See "Understanding the Icarus Interface" on page 24 for instructions on working with these and other features now available on the interface.

Palette Shortcut

You can also open a project from the Palette, which appears to the right of the Main Window in the default interface arrangement (it can also be floated in the Main Window or dragged onto the Main Window and re-sized, as shown below). In the Projects view tab, right-click on a scenario and, on the pop-up menu, click **Open**.



This opens the selected scenario.

Working with Templates

Adding a Template.

To add a new template:

1 Click **File | New Template**.

The **Create New Template** dialog box appears.

2 On the **Create New Template** dialog box type the Scenario name.

3 Click **OK**.

The **Project Properties** dialog box appears.

4 On the **Project Properties** dialog box, enter:

- the project description
- the units of measure (IP or Metric)
- any (optional) remarks

5 Click **OK**.

The project is created. Note that the Title Bar indicates **Templates (name you entered for the scenario).**

Creating a Project by Importing a Template

You can create a new project based on an existing template.

To do this:

1 Launch the Aspen Economic Evaluation application.

2 Click **File | New**.

3 On the **Create New Project** dialog box that appears, specify the project and scenario name.

4 Click the **Template** button on the right of the dialog box.

The I**mport Template** dialog box appears showing h all available templates.

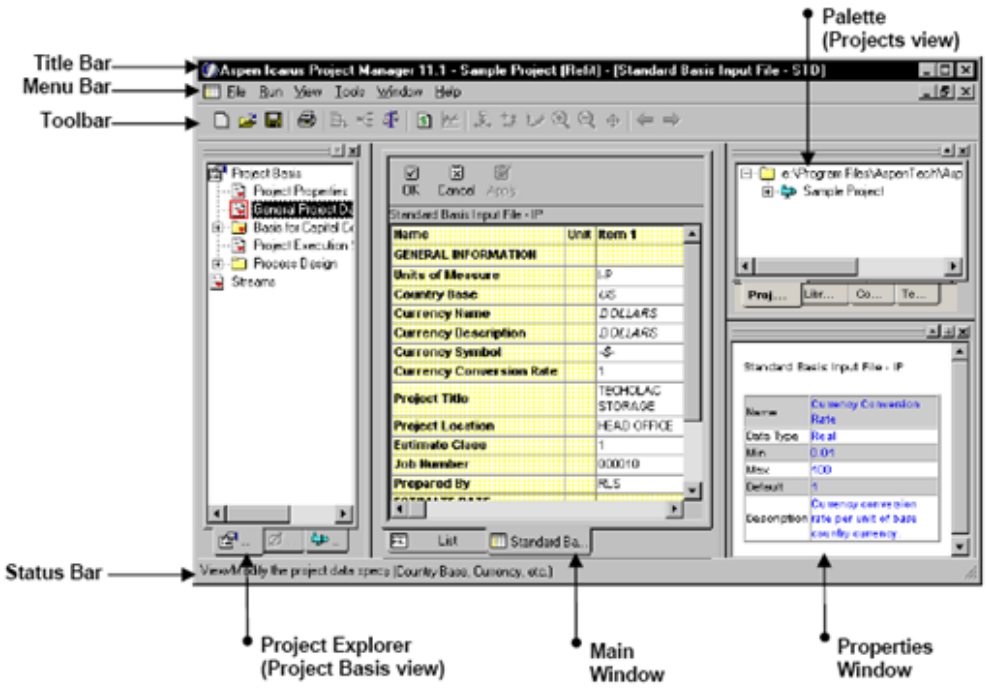
5 Click the template you want to import; then click **OK**.

The **Project Properties** dialog box appears, on which you can continue to enter information for the new project.

Note: When opening a project from a template, or opening a template itself, not all of the buttons on the Aspen In-Plant Cost Estimator Toolbar are available.

Understanding the Icarus Interface

The Icarus interface lets you see multiple windows and documents. You can customize the interface arrangement. The following is the default interface arrangement, with a specifications form open in the Main Window.



The Icarus interface includes the following features:

This feature	does this
Title Bar	Displays the project file name and current Main Window view.
Menu Bar	Displays menu options.
Toolbar	Allows access to Aspen In-Plant Cost Estimator functions. See page 37.
Main Window	Provides workspace for all Aspen In-Plant Cost Estimator documents, List view, specification forms, and other views. See page 27.
Palette	Allows access to libraries, projects, and components. See page 30.
Status Bar	Displays Aspen In-Plant Cost Estimator system status.
Properties Window	Describes the field selected on the specifications form. See page 34.

Project Explorer

Project Explorer is a graphical representation of the project. It has three views: Project Basis view, Process view (not used in Aspen In-Plant Cost Estimator), and Project view. Each view organizes items in a tree format. Switch views by selecting the appropriate tab at the bottom of Project Explorer. (Stretching the width of the Project Explorer will display the full names on the tabs.) The different views are described on page 26.

To expand a tree level, click on "+" next to the condensed level. To condense a tree level, click on "-" next to the expanded level.

Project Explorer Views

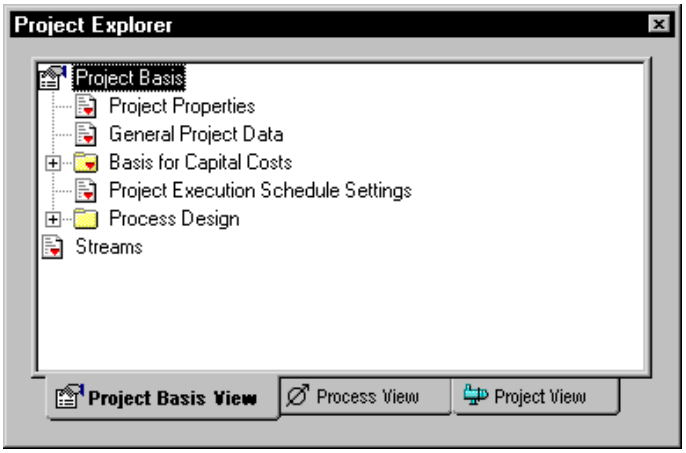
Project Basis View displays project basis specifications. Double-click on a specification to view and/or modify it. A red arrow on an icon in this view indicates that you can right click on the icon for options.

Level	Icon	Description
2		Specifications folder
3		Specification

Process View is used in Aspen Process Economic Analyzer to display simulator data information. It is not used in Aspen In-Plant Cost Estimator.

Project View displays project data information. Here is where Icarus project components can be defined.

Level	Icon	Description
1		Main Project, containing the default Main Area and any user-added areas
2		Area
3		Project component

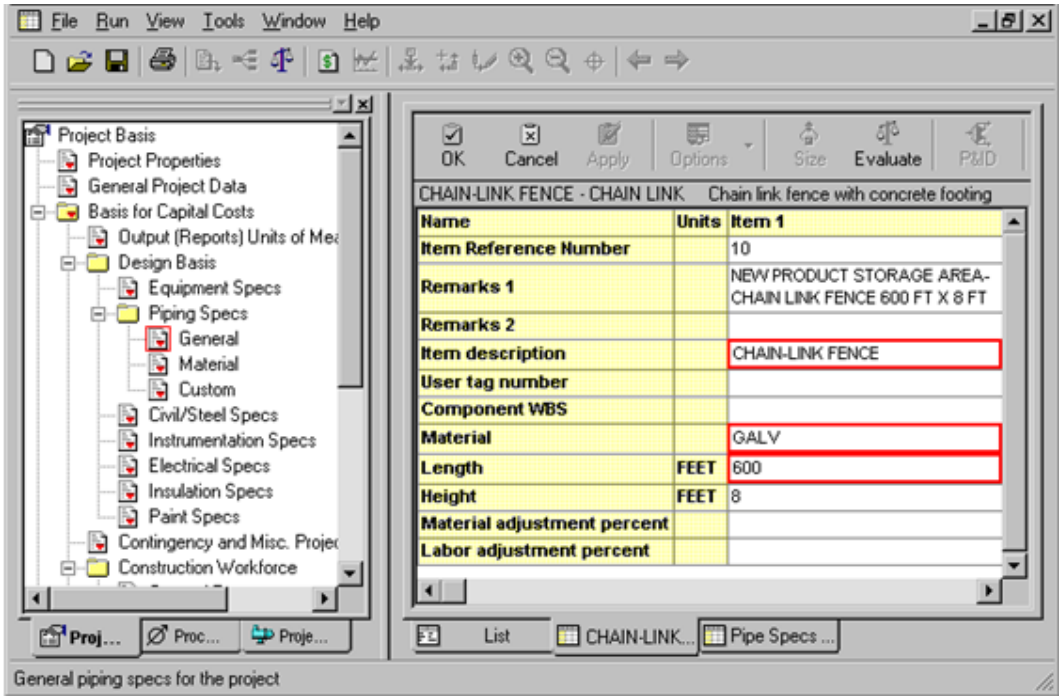


The Project Explorer can be dragged over the Main Window and re-sized, as shown here.

See *Customizing the ICARUS Interface* on page 36 for display options

Main Window

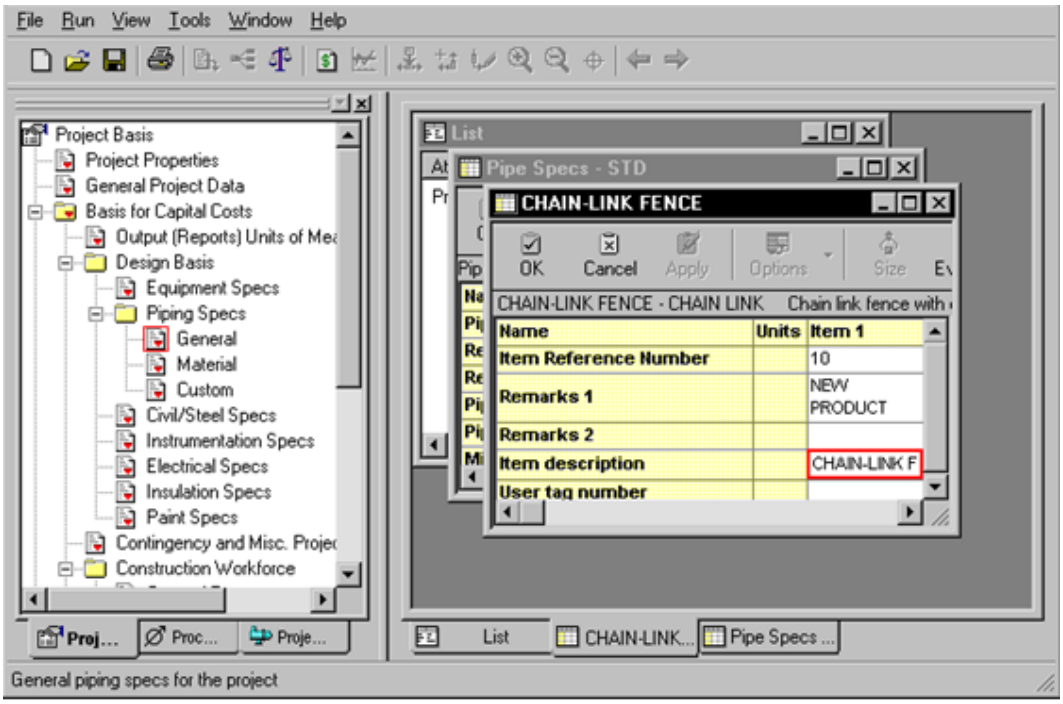
The Main Window is located to the right of Project Explorer by default. The Main Window is a workspace for all Aspen In-Plant Cost Estimator documents, the List view, and other views. The relative size of each window can be adjusted by clicking on the division bar and dragging it to the desired location.



Here, the Main Window in Workbook Mode displays several tabs because a component specifications form and a project specifications form have been opened.

By default, the Main Window is in Workbook Mode. In this mode, tabs are placed at the bottom of the window. These tabs represent all windows open in the Main Window. Clicking on a tab brings the associated window to the foreground.

Clicking **Tile** or **Cascade** on the Window menu displays all windows open in the Main Window. Regardless of the window arrangement, the tabs are still at the bottom of the Main Window when in Workbook Mode. Clicking the maximize button ( ) on a window returns all windows to full tab view. Clicking the condense button ( ) on the menu bar displays all windows open in the Main Window as they were when last condensed.



Note: This is how the Main Window appears when in **Workbook** Mode with **Cascade** selected as the condensed window arrangement.

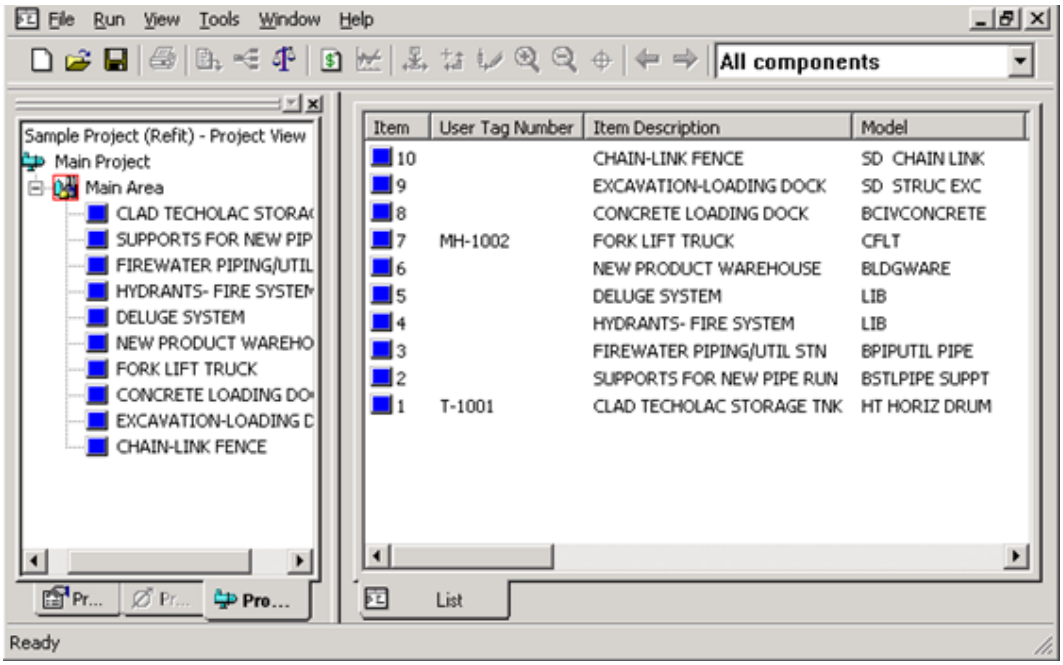
Aspen In-Plant Cost Estimator lets you float Project Explorer, the Palette, and the Properties Window in the Main window. When in this state, these windows behave just like other windows that are part of the Main Window. See "Customizing the Icarus Interface" on page 36 for details.

You can turn off Workbook Mode by unmarking Workbook Mode on the View menu.

When Workbook Mode is off, no tabs are displayed; to bring a window to the front, you must click on the desired window or select the desired window from the Window menu.

List View

The **List** view in the Main Window displays details on items selected in Project Explorer. For example, when you click on an area in Project Explorer's Project view, the List view displays a list of all components in the area. This is referred to as the "area-level" list (shown below), in which the components are displayed in rows with component details in columns. When you click on a component in Project Explorer's Project view, the List provides information only on the selected component, with component details listed in rows. This is referred to as the "component-level".



Note: In the interface arrangement pictured here, the Palette and the Properties Window have been hidden to make room for the Main Window. Press ALT+1 to hide or display the Palette and press ALT +2 to hide or display the Properties Window. Press ALT +0 to hide or display Project Explorer.

Filtering Mechanism

You can limit area-level lists to a single category of component. To do so, click the drop-down arrow on the toolbar and click on a category.

For example, if you click **? Incomplete Items**, the list will only include components that still have specifications that need to be entered in order for the component to be included in an evaluation.

Column Settings

You can select which columns appear on the area-level list and in which order.

To change column settings on the area-level list:

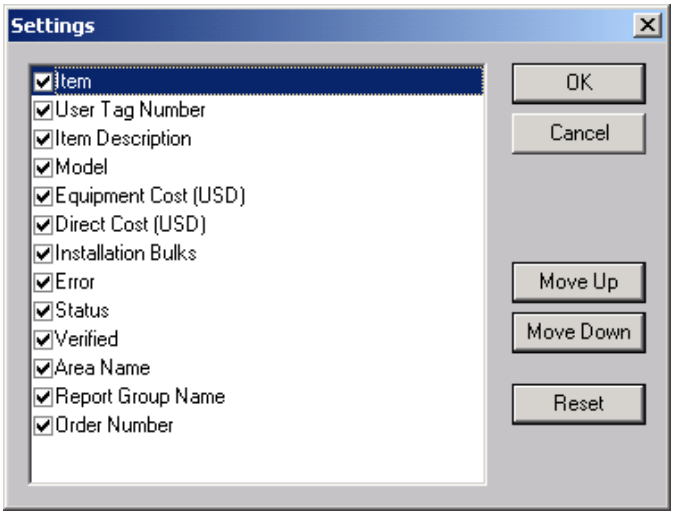
1 Right-click on any of the column headings.

A pop-up menu lists all of the columns. Columns currently displayed are checked.

2 To simply hide/unhide a column, you can click it on the menu.

3 To change the order, click Settings on the menu.

The **Settings** dialog box appears.



4 To move a column to the right on the List View, click Move Down. To move a column to the left, click Move Up. The Reset button returns to columns to the default setting (shown above).

5 Click **OK** to save the settings.

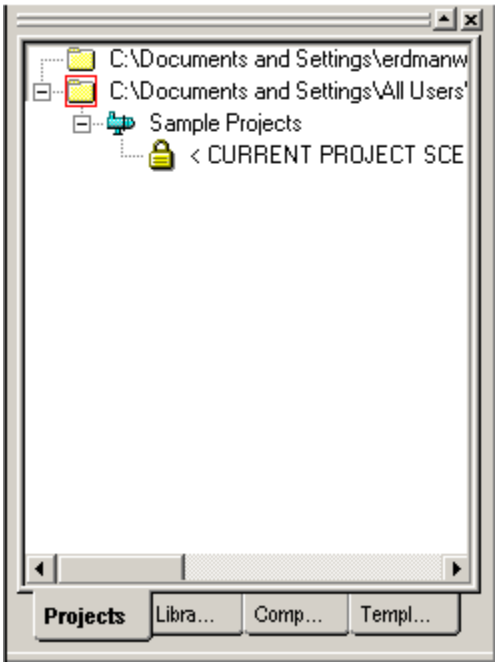
When you restart Aspen In-Plant Cost Estimator, all columns will be displayed in the default order unless Save Window States is selected in Preferences (by default, Save Window States is selected). See "Saving Window States" on page 37 for more information.

Palette

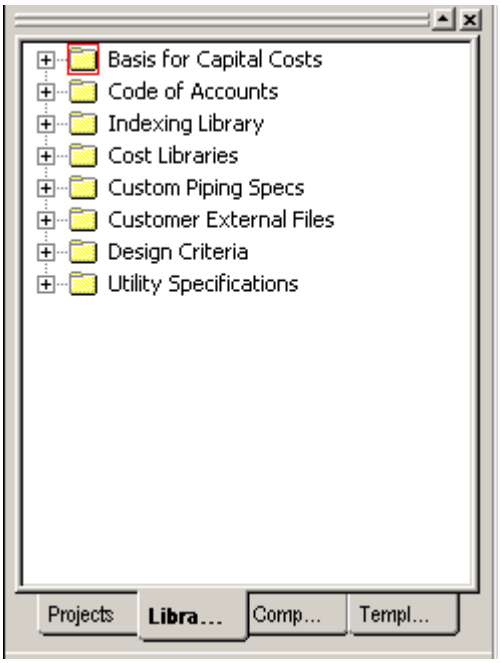
The Palette contains elements that you can apply to the project scenario. If you think of Project Explorer as a picture of the project scenario, you might

think of the Palette's contents as the pigments and dyes used to first sketch out and then color in that picture.

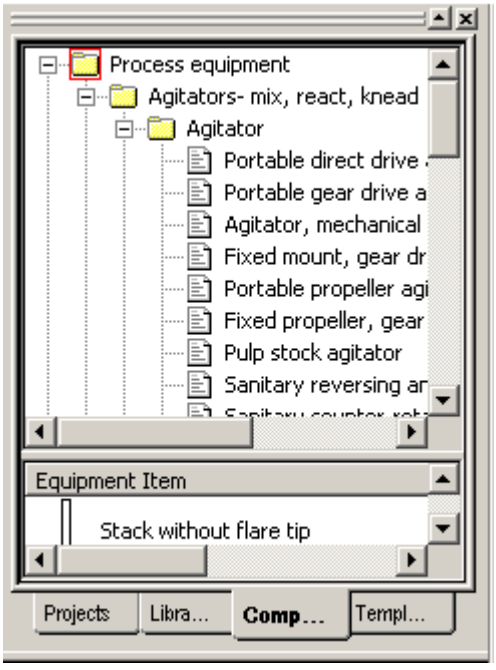
For example, if you want to import areas or components from another scenario into your current scenario, you can double-click on the scenario in the Palette to get a listing of its areas and components and then drag the area/component to the Project Explorer's Project View. (See "Importing Project Components" on page 186.)



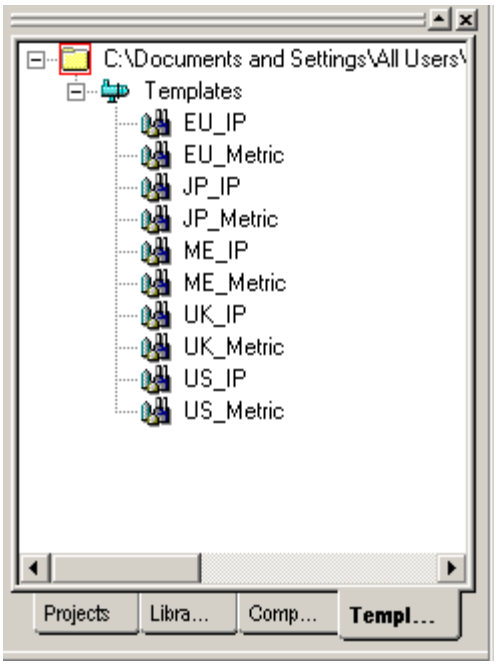
Likewise, the Palette's **Libraries** view contains libraries of Project Basis specification files that, in Project Explorer's Project Basis view, you can select to use. From the Palette, you can develop the libraries by creating new files, modifying existing files, and importing files. (See "Specification Libraries" on page 147.)



When you add a component to the project scenario, you can choose from the components listed in the Palette's **Components** view. Then, after you add the component, it appears in Project Explorer's Project view. (See Chapter 4, "Defining Project Components").

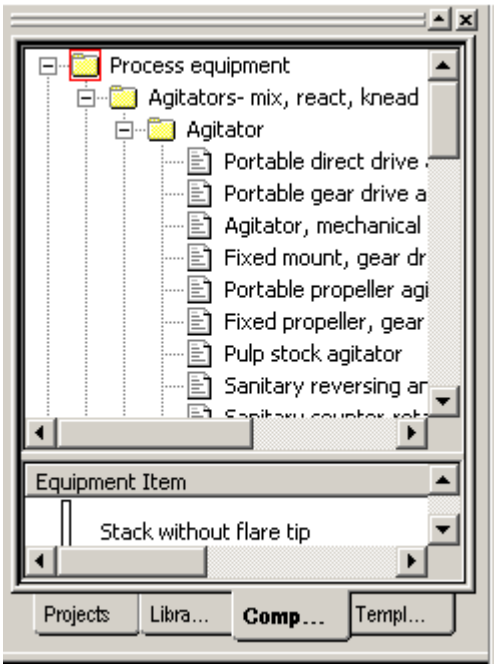


Finally, if you want to work with templates, both the default templates included with Aspen In-Plant Cost Estimator and any templates you may have created, you can use the **Templates** tab.



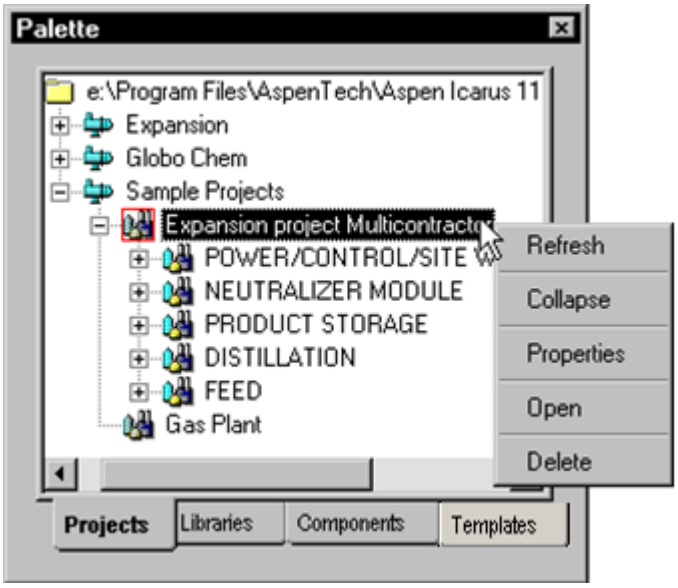
In the default interface arrangement, the Palette appears on the right side of the screen. Like Project Explorer, it can be displayed in a variety of ways. See "Customizing the Icarus Interface" on page 36 for display options. To hide/display the Palette, press **ALT+1** or used the checked command on the View menu.

As indicated previously, the Palette has four views: Projects, Libraries, Components, and Templates. The Components view, shown below, has a scrollable split window that displays details on equipment items. The division bar can be adjusted to hide or expand the details section.



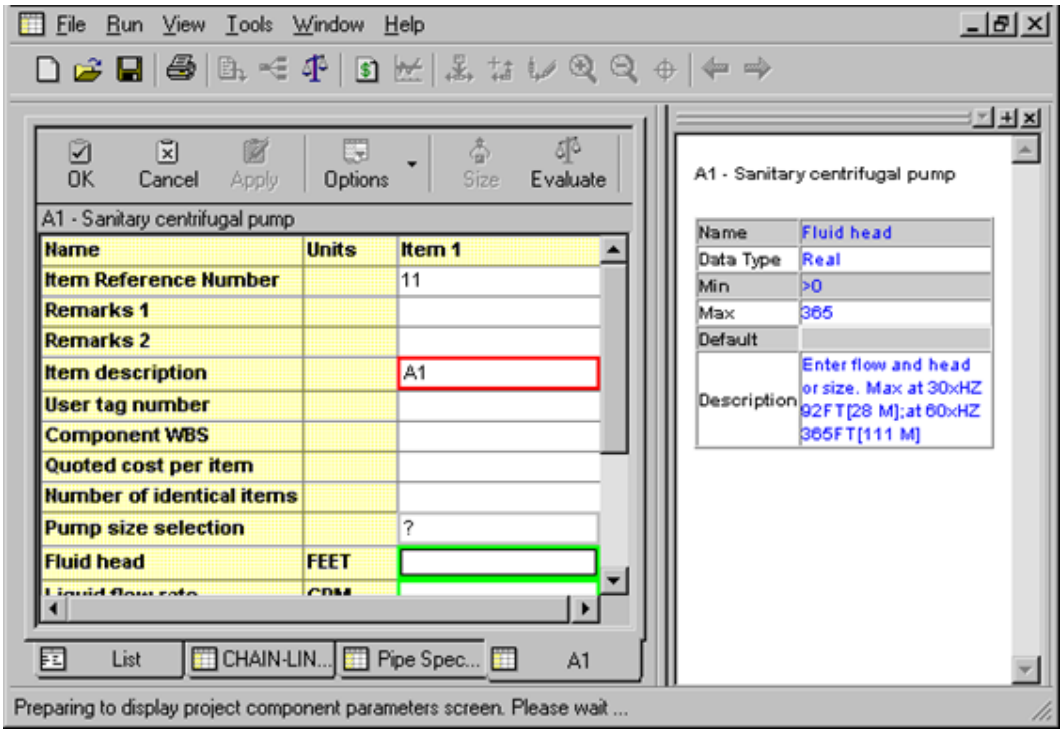
Note: The Palette pictured in this section has been dragged onto the Main Window and re-sized.

In addition to allowing you to import the contents of other scenarios, the Projects view provides options for opening scenarios, viewing scenario properties, and deleting scenarios. Right-click on a project scenario to access the pop-up menu of options. The Projects view displays all projects in the default project folder and any other active project folders (see "Locations" on page 49 for information on adding project directories).



Properties Window

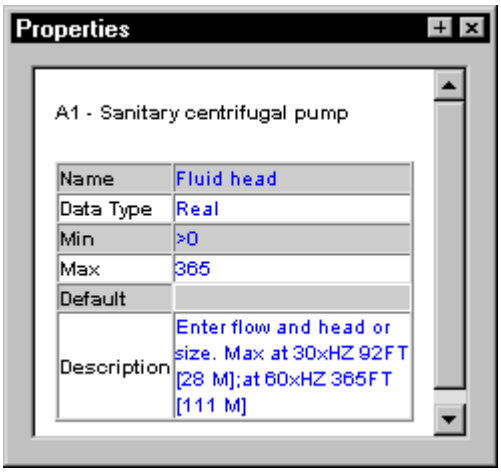
When you select a field on a specifications form, the **Properties** Window provides a description of the field. The description often includes minimum, maximum, and default values.


File Run View Tools Window Help
OK Cancel Apply Options Size Evaluate
A1 - Sanitary centrifugal pump
Name Units Item 1
Item Reference Number 11
Remarks 1
Remarks 2
Item description A1
User tag number
Component WBS
Quoted cost per item
Number of identical items
Pump size selection ?
Fluid head FEET
List CHAIN-LIN... Pipe Spec... A1
A1 - Sanitary centrifugal pump
Name Fluid head
Data Type Real
Min >0
Max 365
Default
Description Enter flow and head or size. Max at 30xHZ 92FT[28 M];at 60xHZ 365FT[111 M]
Preparing to display project component parameters screen. Please wait ...

Here, the **Properties** Window (docked on the right side of the screen) displays information on the **Height** field, which is selected on the component specifications form.

Clicking ⊞ on the **Properties** window freezes and unfreezes the content. When the content is frozen, you can move to another field while retaining the description of the original field in the **Properties** window.

Like the Palette and Project Explorer, the **Properties** window can be displayed in a variety of ways. See "Customizing the Icarus Interface" on page 36 for display options.


Properties
A1 - Sanitary centrifugal pump
Name Fluid head
Data Type Real
Min >0
Max 365
Default
Description Enter flow and head or size. Max at 30xHZ 92FT [28 M];at 60xHZ 365FT [111 M]

To hide/display the Properties Window:

- Do one of the following:
  - Press ALT+2.

-or-

- On the **View** menu, use the checked command.

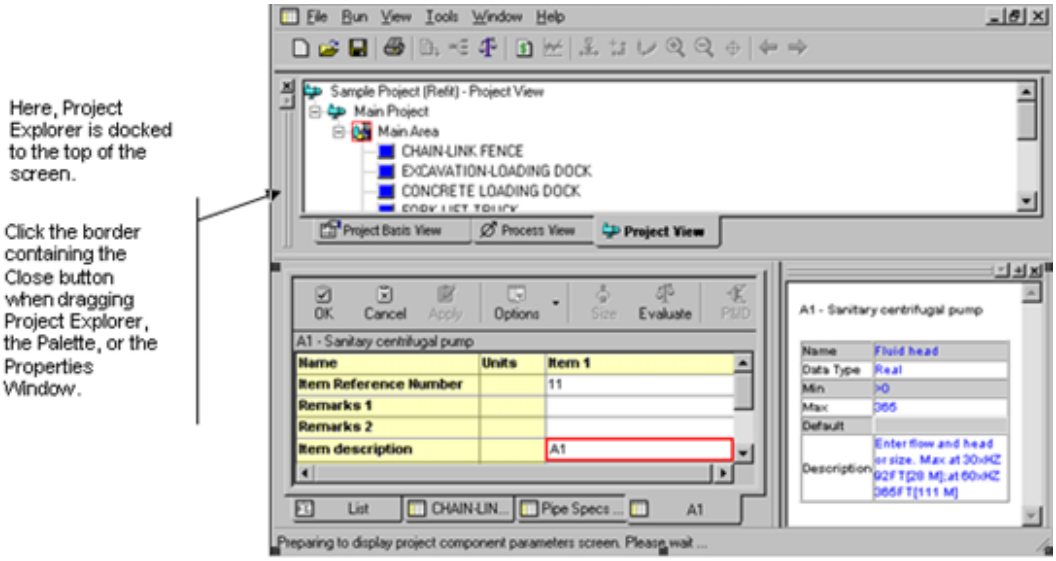
Customizing the Icarus Interface

In the default interface arrangement, Project Explorer docks to the left edge and the Palette and the Properties Window share the right. When docked, windows remain attached to an edge and all other windows are sized to fit in the remaining space available.

Clicking on a border of any of these three windows accesses a pop-up menu from which you can select Allow Docking. When Allow Docking is marked, the window can be docked to any edge.

Note: When the **Float In Main** window is selected on the pop-up menu, the **Allow Docking** command is inactive.

To dock to a different edge, click on the border that contains the Close button (☒) and hold down the mouse button. A bounding outline will appear as you drag the window. Drag the outline to the desired edge and release the mouse button.



When multiple windows are docked to the same edge, you can use the division bar to adjust the relative sizes. You can also use the Contract/Expand (▼/▲) buttons to either switch from one window to the other or split the side.

Undocking by Dragging onto Main Window

One way to undock the window is by dragging it onto the Main Window. Its size can then be adjusted.

Float In Main Window Option

You can at any time select Float In Main Window on the pop-up menu. In this state, the window behaves like the List view or a specifications form, with a tab at the bottom of the Main Window.

Saving Window States

If you are using the default Preferences, Aspen In-Plant Cost Estimator will save the interface arrangement. This way, when you open Aspen In-Plant Cost Estimator the arrangement is the same as you left it.

You can also set the Preferences so that Aspen In-Plant Cost Estimator opens displaying the default arrangement. See the section on the General tab view under "Preferences," page 47, for more information.

Aspen In-Plant Cost Estimator's Toolbar

By default, the toolbar is docked under the menu bar. However, you can float the toolbar by clicking on a blank area of the toolbar and dragging it. You can also dock the toolbar to the bottom of the screen or vertically to the edge of the Project Explorer, Main Window, or the Palette. To do so, drag the toolbar over any one of these areas until an outline of the toolbar appears. Release the mouse button when the outline appears in the desired area.

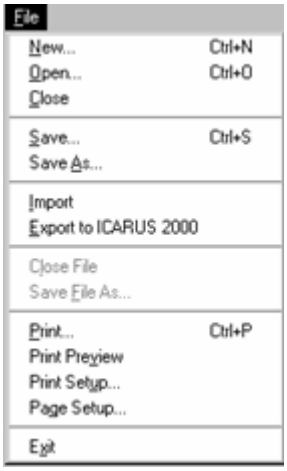
The following toolbar buttons are available in Aspen In-Plant Cost Estimator:

Click this button	to
	Create a new project. See "Creating a New Project" on page 16.
	Open an existing project scenario. See "Opening an Existing Project" on page 22.
	Save the current project.
	Print.
	Run project evaluation. See "Running a Project Evaluation" on page 241 for instructions.
	Launch Aspen Icarus Reporter and load Capital Costs and other reports. See "Reviewing Reports in Aspen Icarus Reporter" on page 243, for instructions.
	Go back. Navigate back through previously viewed links.
	Go forward. Navigate forward through previously viewed links.

Other buttons that appear on the toolbar are always inactive in Aspen In-Plant Cost Estimator. They are for use in other Aspen Icarus programs.

Aspen In-Plant Cost Estimator Menu Bar

File Menu



Click this	to
New	Start a new project scenario. Details on page 16
Open	Open an existing project scenario. Details on page 22
Close	Close the current project scenario.
Save	Save the current project scenario. Details on page 41
Save As	Save the current project scenario as a different file. Details on page 41.
Import	Access instructions for importing areas and components. Details on page 186.
Export to Icarus 2000	Save the current project scenario as an Icarus 2000 (*.ic2) project file.
Print	Print the form or report currently active in the Main Window.
Print Preview	Preview how form or report will appear printed.
Print Setup	View and modify printer name and properties, paper size and source, and orientation.
Exit	Close Aspen In-Plant Cost Estimator.

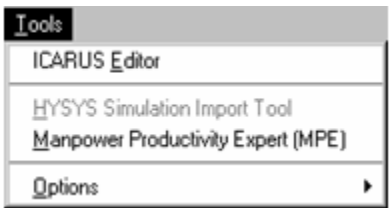
Run Menu

Click this	to
Evaluate Project	Run a project evaluation. See Chapter 7, “Evaluating the Project.”
Schedule	Send preliminary schedule to scheduling program. See Chapter 8, “Developing a Schedule.”
Scan for Errors	Scan for potential errors in the project evaluation.
Re-number	Re-number project components or project areas so that the numbering contains no gaps. Details on pages 190 and 191.

View Menu

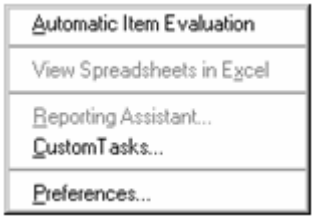
Click this	to
Toolbar	View or hide the toolbar. See page 37 for descriptions of toolbar buttons.
Status Bar	View or hide the status bar. See page 24 for description of the status bar.
Project Explorer	View or hide Project Explorer. See page 26 for description of Project Explorer.
Palette -	View or hide the Palette. See page 30 for description of the Palette.
Properties Window	View or hide the Properties Window. See page 34 for a description of the Properties Window.
Workbook Mode	Turn Workbook Mode on and off. See page 27 for an explanation of Workbook Mode.
Capital Costs View	Launch Aspen Icarus Reporter. The Project Evaluation needs to have already been run. See Chapter 7, “Evaluating the Project.”

Tools Menu



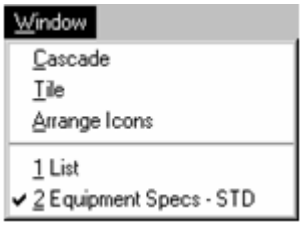
Click this	to
Icarus Editor	Launch Icarus Editor. In the latest version of Aspen In-Plant Cost Estimator, all project reports are viewed in Aspen Icarus Reporter. Icarus Editor is retained for use in Aspen Process Economic Analyzer.
Manpower Productivity Expert (MPE)	Launch MPE. See page 79 for details.
Options	Access Options sub-menu. See below.

Options Sub-menu



Click this	to
Automatic Item Evaluation	Turn Automatic Item Evaluation on and off. A check mark indicates the feature is turned on. See page 272 for feature description.
Custom Tasks	This command is for use in Icarus 2000 only.
Preferences	Access Preferences. See “Preferences” on page 47 for details.

Window Menu



Click this	to
Cascade	View the Main Window contents in Cascade mode. See page 27.
Tile	View the Main Window contents in Tile mode. See page 27.
Arrange Icons	Return all minimized windows to the bottom of the Main Window.
# XXX	View opened window in the Main Window.

Help Menu

Click this	to
Contents	Access Docs.pdf.
About	Access program information, version number, and copyright information.

Working with Project Scenarios

This section explains how to save, delete, salvage, and unlock project scenarios.

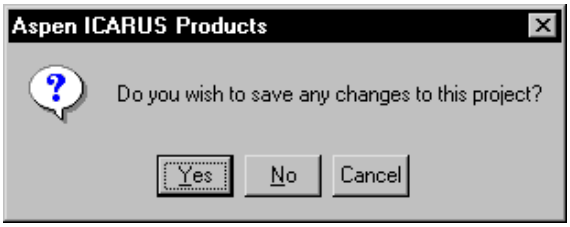
Saving Project Scenarios

To save a project scenario:

- Click on the toolbar or click Save on the File menu.

Aspen In-Plant Cost Estimator saves any changes.

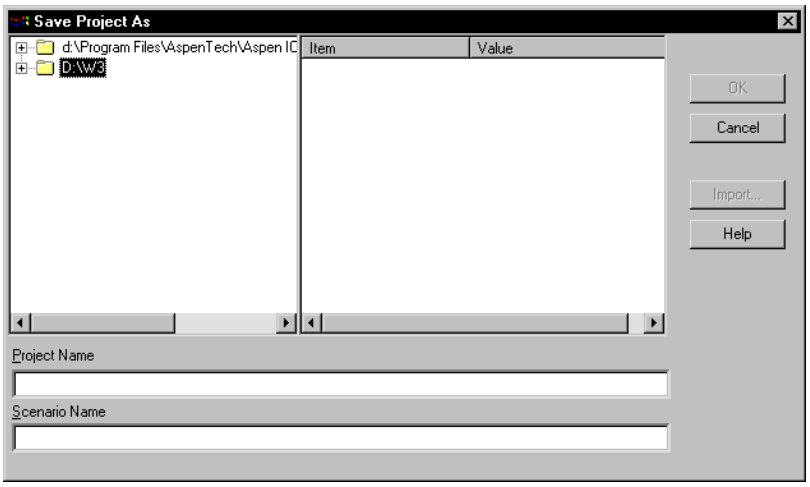
If you are using the default Preferences settings, Aspen In-Plant Cost Estimator will ask if you wish to save any changes when you close the project scenario.



You can select in **Preferences** not to have this prompt appear (see page 47).

To save the scenario with a new name:

1 Click Save As on the File menu.



Save As is useful when studying alternatives.

Note: You can save scenarios to project directories other than the default one provided by Aspen In-Plant Cost Estimator. See "Locations" on page 49 for instructions.

2 Specify a Project Name and Scenario Name and click **OK**.

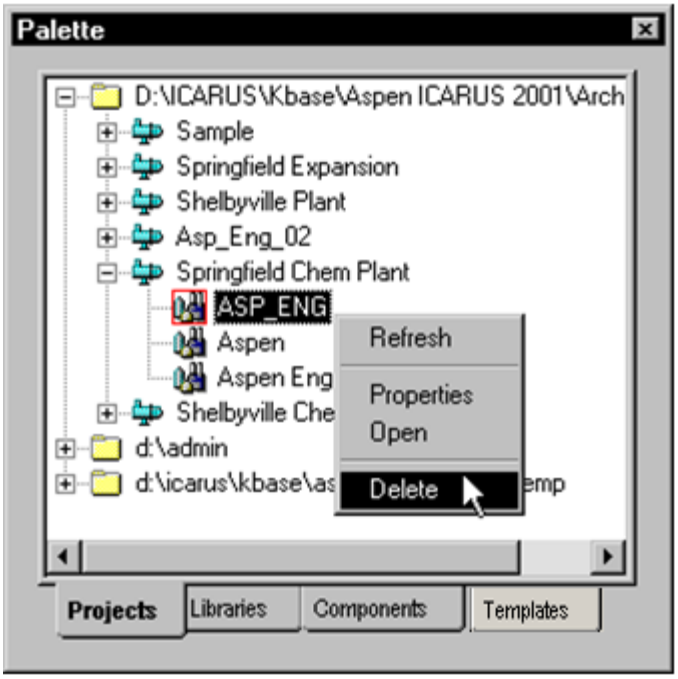
Aspen In-Plant Cost Estimator saves the scenario as specified.

Deleting Project Scenarios

It is recommended that you delete scenarios when they are no longer needed. Deleting old scenarios opens free disk space and makes working with scenarios easier.

To delete a project scenario:

1 To delete a project scenario, right-click the scenario within the project directory and click **Delete** on the pop-up menu.



A dialog box asks you to confirm deletion.

Note: You can select in Preferences not to have this prompt appear (see page 47).

2 Click **Yes** to delete the project or scenario.

-or-

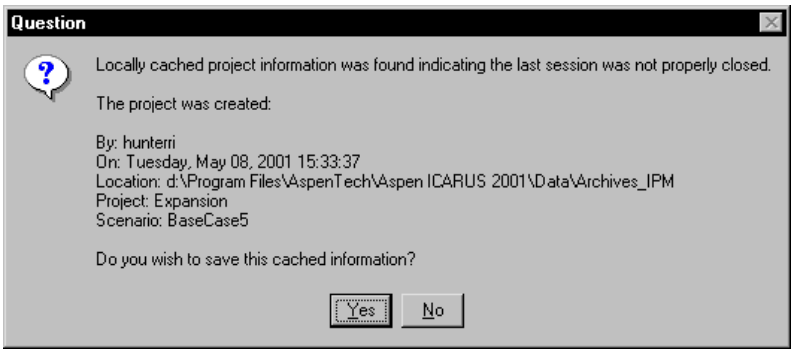
Click **No** to retain the project or scenario.

Salvaging Project Scenarios

If you exit Aspen In-Plant Cost Estimator abnormally without being able to save the current project scenario, you can salvage the project scenario from cached project information.

To salvage a project scenario:

1 Restart Aspen In-Plant Cost Estimator. A window appears asking if you wish to save the cached information found in storage.


Question
Locally cached project information was found indicating the last session was not properly closed.
The project was created:
By: hunterri
On: Tuesday, May 08, 2001 15:33:37
Location: d:\Program Files\AspenTech\Aspen ICARUS 2001\Data\Archives_IPM
Project: Expansion
Scenario: BaseCase5
Do you wish to save this cached information?
Yes
No

2 Click **Yes**. Aspen In-Plant Cost Estimator displays the **Salvage Project As** dialog box.

3 Specify a project and scenario name.

You cannot overwrite the scenario being salvaged; you must specify a project and scenario name different from that of the original scenario.

4 Click **OK**.

Aspen In-Plant Cost Estimator creates the new scenario. Except in name, this project scenario will be identical to the scenario that was open when Aspen In-Plant Cost Estimator was abnormally exited. After creating the new scenario, Aspen In-Plant Cost Estimator asks if you wish to open it.

Unlocking Project Scenarios

If Aspen In-Plant Cost Estimator crashes while you have a project scenario open, Aspen In-Plant Cost Estimator remembers that you have the project scenario checked out. When you re-open Aspen In-Plant Cost Estimator, you will have to unlock the project scenario before opening it.

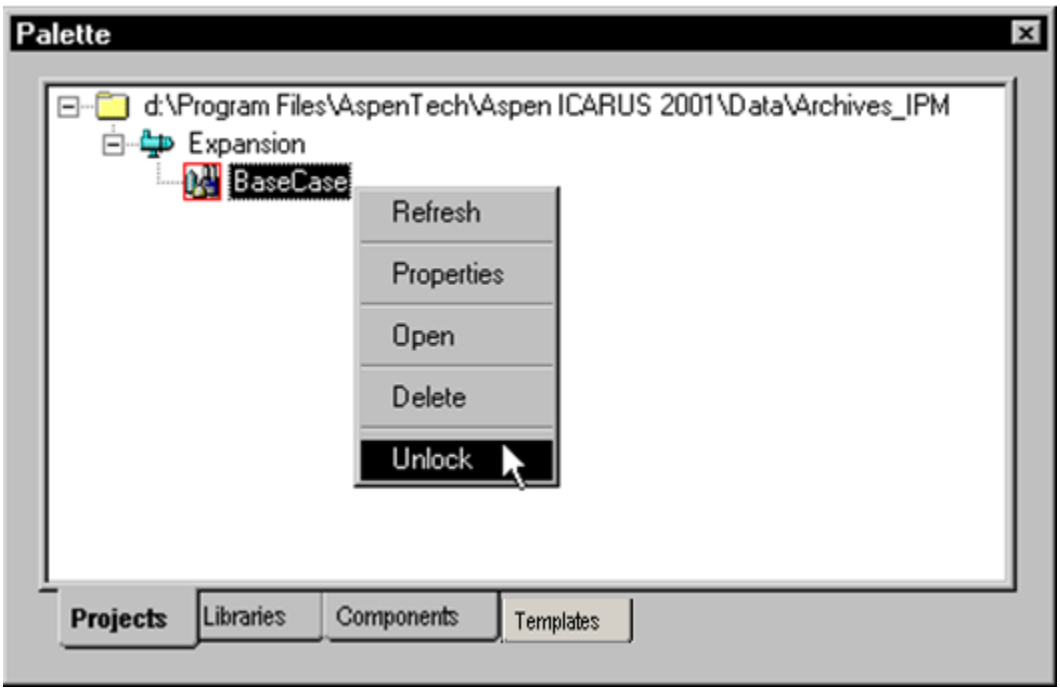
Anyone trying to open a locked project is denied access and provided with a message that states the time the project scenario was checked out, the user name of the person who checked it out, and the computer on which it was checked out.

Project in use
The project 'Expansion - BaseCase' was checked out at 14:34 on Monday, Apr 30, 2001 by hunterri on computer 'RICHARD'.
OK

A project can only be unlocked by the user who checked it out or by an administrator.

To unlock a project scenario:

- Right-click on the project scenario in the Palette (Projects view) and click Unlock on the pop-up menu.



You can now open the project scenario as you normally would.

Copying Project Directories

Within a project directory, Aspen In-Plant Cost Estimator creates an independent folder for each project and also creates, within each project folder, an independent folder for each project scenario. This makes it easy to move project scenario files from one computer to another on the same network. Simply copy and paste the folder in Windows Explorer.

You can also copy an entire project directory with multiple project and project scenario folders. Doing so creates an identical set of folders and files in the new location.

See “Locations” on page 49 for information on adding project directories and setting a new default project directory.

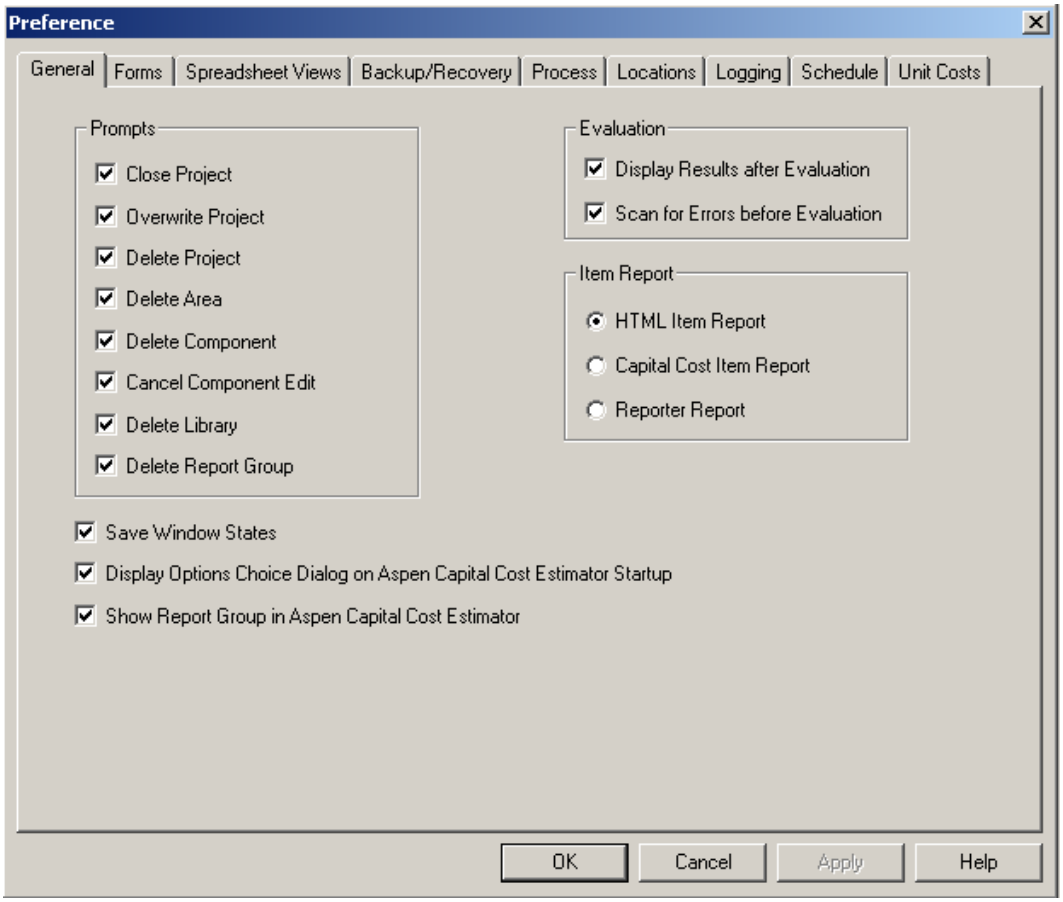
Preferences

The settings in Preferences allow you to specify how Aspen In-Plant Cost Estimator will act each time it is used.

To access Preferences:

- Click **Options** on the **Tools** menu, and then click **Preferences** on the sub-menu.

Aspen In-Plant Cost Estimator displays the **Preferences** dialog box.



Click	to
OK	Save changes and close the Preferences.
Apply	Save changes without closing Preferences.
Cancel	Close Preferences without saving changes. (Clicking **Apply** and then immediately clicking **Cancel** would have the same effect as clicking **OK**.)

General

In the **General** tab view, you can select the following:

Prompts

Select which prompts appear.

Close Project – prompt to save any changes when closing project.

Overwrite Project – prompt to confirm overwriting project that has the same name as the one being created.

Delete Project – prompt to confirm deletion of project.

Delete Area – prompt to confirm deletion of area.

Delete Component – prompt to confirm deletion of component.

Cancel Component Edit – prompt to save changes when you click Cancel after editing a Component Specifications form.

Delete Library – prompt to confirm deletion of specification library.

Delete Report Group – prompt to confirm deletion of report group in Aspen Capital Cost Project Estimator. Aspen In-Plant Cost Estimator does not include report groups.

Evaluation

Display results after evaluation - mark to have Aspen In-Plant Cost Estimator open Aspen Icarus Reporter and load reports after you run an evaluation.

Scan for Errors before evaluation – mark to have Aspen In-Plant Cost Estimator scan for errors before evaluation.

Item Report

Select which type of report you wish to display when generating an Item Report.

HTML Item Report – mark to display the HTML Item Report, like the one shown on page 270, in the Main Window

Capital Cost Report – mark to display the Capital Cost Report in Icarus Editor when running Aspen Process Economic Analyzer. Aspen In-Plant Cost Estimator does not use Icarus Editor.

Reporter Report – mark to display the Single Component Summary, exported from Aspen Icarus Reporter, in the Main Window.

Display

Save Window States – mark to have Aspen In-Plant Cost Estimator save the position of Project Explorer, the Main Window, the Palette, and the Properties Window, as well as selected columns on the List view. Unmark to have Aspen In-Plant Cost Estimator open with the default interface arrangement (shown on page 24).

Display IPE&Analyzer Choice Dialog on Aspen Capital Cost Project Estimator – mark to have Aspen Capital Cost Project Estimator ask you at startup whether to use Aspen Process Economic Analyzer or Analyzer in the

Aspen Capital Cost Project Estimator environment. This option is included here because Preference selections, except for file locations, made in one Icarus product affects the Preference selections in all other Aspen Icarus products in the AES suite.

Show Report Group in Aspen Capital Cost Project Estimator – mark to have report groups displayed in Aspen Capital Cost Project Estimator.

Forms

The Forms tab view provides options related to Component Specification and Installation Bulk forms.

Display P&I Installation Bulks in Grid – mark to have Aspen In-Plant Cost Estimator display all items on the Installation Bulk specification forms for Pipe and Instrumentation. If you unmark the checkbox, Aspen In-Plant Cost Estimator lets you select, when opening the form, the items to include.

Use OK Button in Installation Bulks Form to Go to Main Component Form – mark to have Aspen In-Plant Cost Estimator return you to the main Component Specifications form when you click **OK** on an **Installation Bulks** form. Otherwise, clicking **OK** simply closes the Component specifications.

Save Component When Switching to Different Installation Bulk or Main Component Form – mark to have Aspen In-Plant Cost Estimator save the Component specifications when you switch to a different form on the Component's **Options** menu.

Backup/Recovery

The **Backup/Recovery** tab lets you select when backups are to be performed. You can select both options.

Automatic Task Backup – select this check box to have Aspen In-Plant Cost Estimator perform a backup before executing major tasks, such as a project evaluation.

Timed Backup (Interval, in minutes) – select this check box to have Aspen In-Plant Cost Estimator perform a backup at a specified interval. Specify the interval in the box provided.

Timed Recovery (Interval, in minutes) – select this check box to have Aspen Economic Evaluation write a recoverable file at the specified interval. Specify the interval in the box provided. If an Economic Evaluation application crashes, when you open the Aspen Economic Evaluation application that crashed, you are prompted to recover your file and save it with a new name.

Note: After a project has crashed and been recovered (under the new name), the original project that crashed should be deleted as it may no longer be in a stable state.
After deleting the crashed project, you can rename the recovered project to the previous name if you want.

You can also select to either have Aspen In-Plant Cost Estimator overwrite the project backups or create unique backups.

Overwrite Project Backups – select this check box to have Aspen In-Plant Cost Estimator overwrite the previous backup every time the program performs a backup.

Unique Project Backups – select this check box to have Aspen In-Plant Cost Estimator retain previous backups by creating a unique backup each time. Depending on the frequency of backups (see task and timed backup options above), selecting Unique Project Backups could result in large amounts of disk space being consumed by backups.

Process

The Process tab view provides options for importing from an external project.

Import Connected Streams – select this check box to include connected streams when importing an external project.

Import Installation Bulks – select this check box to include installation bulks when importing an external project.

The **Process** tab view also provides options for unsupported simulator models and custom models.

Map Unsupported Models To Quoted Cost Item – select this check box to have Aspen Process Economic Analyzer map, by default, unsupported simulator models to quoted cost items. This option is included here because Preference selections, except for file locations, made in one Icarus product affects the Preference selections in all other Aspen Icarus products in the AES suite. See the IPE User's Guide for details on this option.

Activate Custom Model – select this check box to activate the Custom Model tool explained on page 191.

Locations

In the **Locations** tab view, you can select:

- **Project Directories**

Add/remove alternate project directories and set the default project directory. See "Adding Project Directories" on page 50 for instructions.

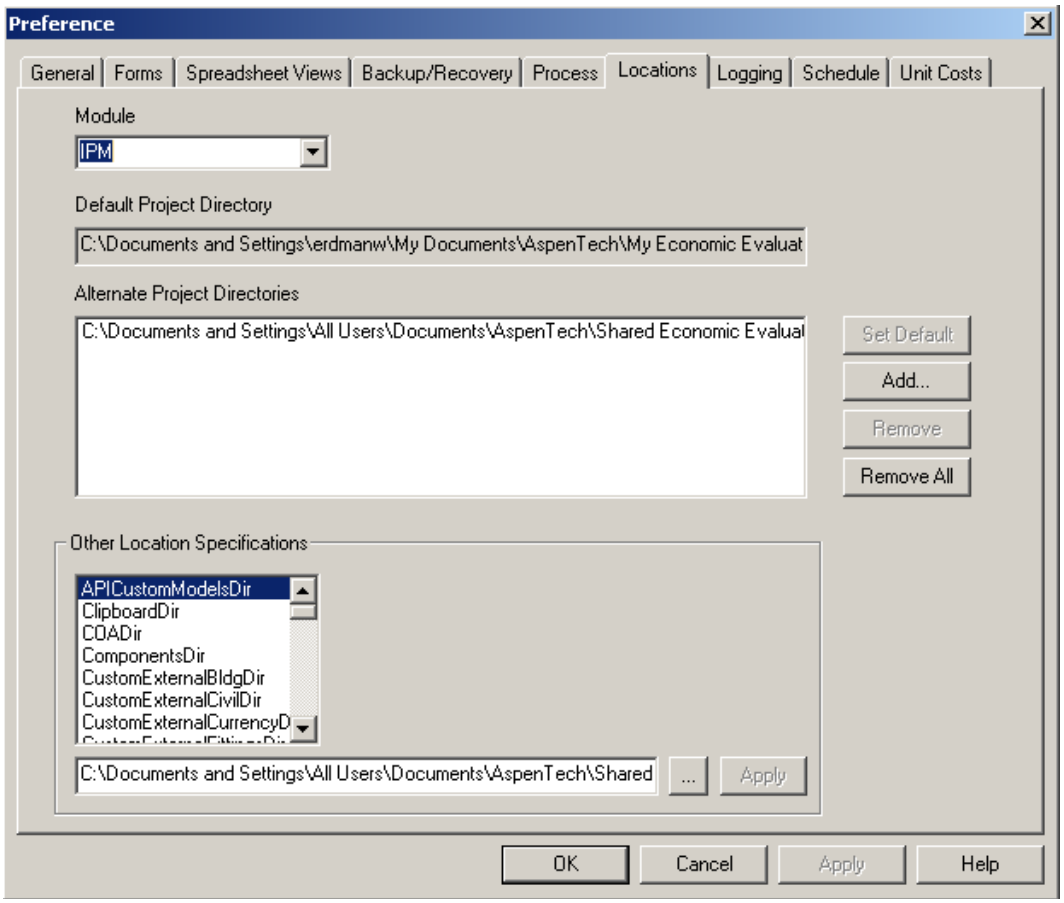
- **Other Location Specifications**

To specify the location of various specification files and data:

1 Click an item in the list to display its description and location.

2 Click the **Browse** button to select a new location.

Notes:
In some cases the description warns against changing the location.
Make sure to create the **IP** and **MET** subfolder structure when changing the source locations for library files that are units dependent (for example, **Basis for Capital Cost**, **EML**, **UML**, **Custom Piping Specs**, and so on).



Adding Project Directories

Aspen In-Plant Cost Estimator comes set up with two project directories:

...\AspenTech\Economic Evaluation V7.3\Data\My Econ_In-Plant Projects

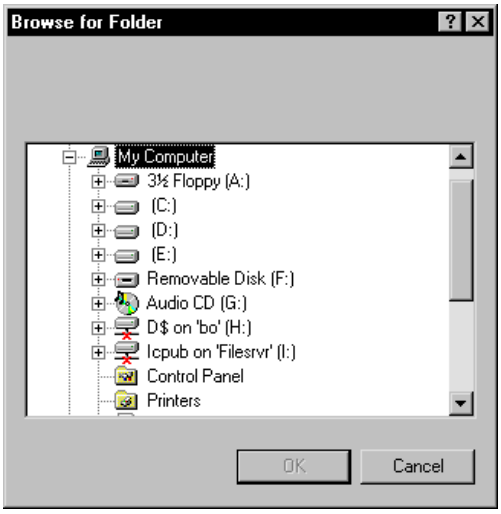
...\AspenTech\Economic Evaluation V7.3\Data\Archives_Econ_In-Plant

These directories, by default, are the sole choices of project directory when opening or saving a new project, as well as the only directories displayed on the Palette's **Projects** view.

To add a project directory and set a new default directory:

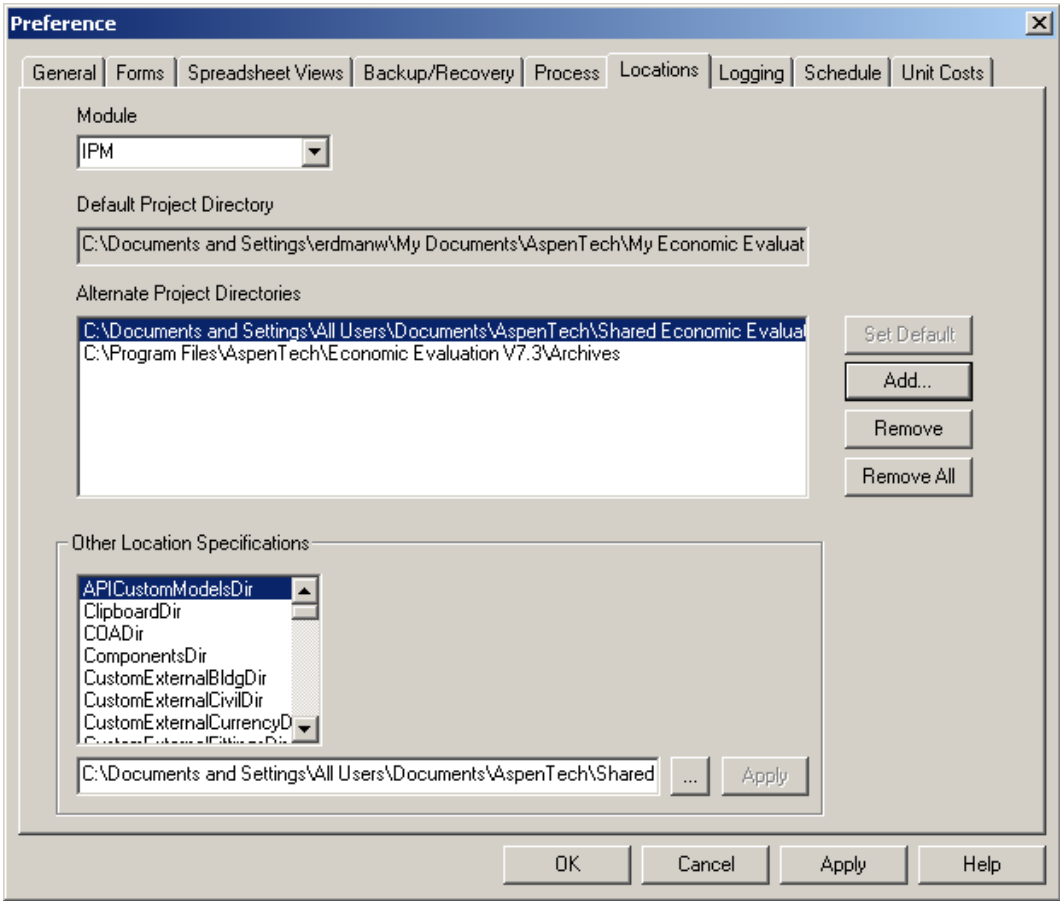
1 Click **Add** on the **Locations** tab view of the **Preference** dialog box.

The **Browse for Folder** dialog box appears.



2 Select the folder you wish to add as an alternate directory and click **OK**.

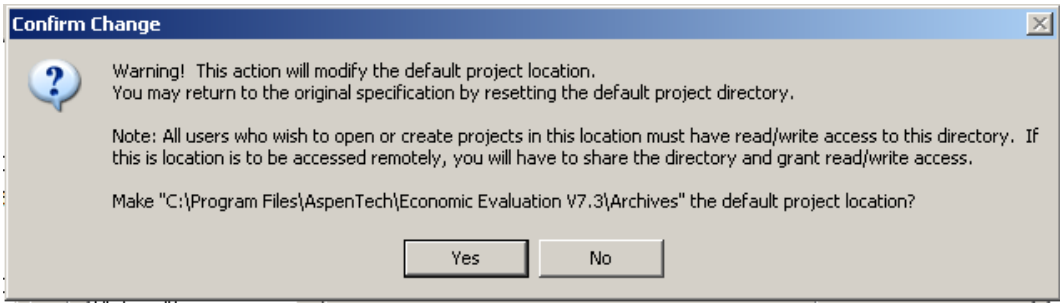
Aspen In-Plant Cost Estimator adds the directory to the **Alternate Project Directories** list.



3 To set an alternate project directory as the default, select it and click Set Default.

Aspen In-Plant Cost Estimator displays a prompt asking you to confirm the change. Click **Yes** to set the new default.

If the old default location is not on the list of alternate project directories, Aspen In-Plant Cost Estimator displays another prompt asking if you wish to add it to the list.


Confirm Change
Warning! This action will modify the default project location.
You may return to the original specification by resetting the default project directory.
Note: All users who wish to open or create projects in this location must have read/write access to this directory. If this is location is to be accessed remotely, you will have to share the directory and grant read/write access.
Make "C:\Program Files\AspenTech\Economic Evaluation V7.3\Archives" the default project location?
Yes
No

Note: Adding the old default directory to the alternate project directory list allows you to easily revert to it

4 Click **Yes** or **No**.

5 Click **OK** to save the changes to Preferences.

6 Before the added project directory appears on the Create New Project dialog box and elsewhere, you will need to either:

- Restart Aspen In-Plant Cost Estimator.

-or-

- Right-click on the current project in the Palette and click refresh on the pop-up menu.

Logging

The Logging tab view is reserved for future releases, in which it will be used to help clients with Technical Support issues. It is not currently activated.

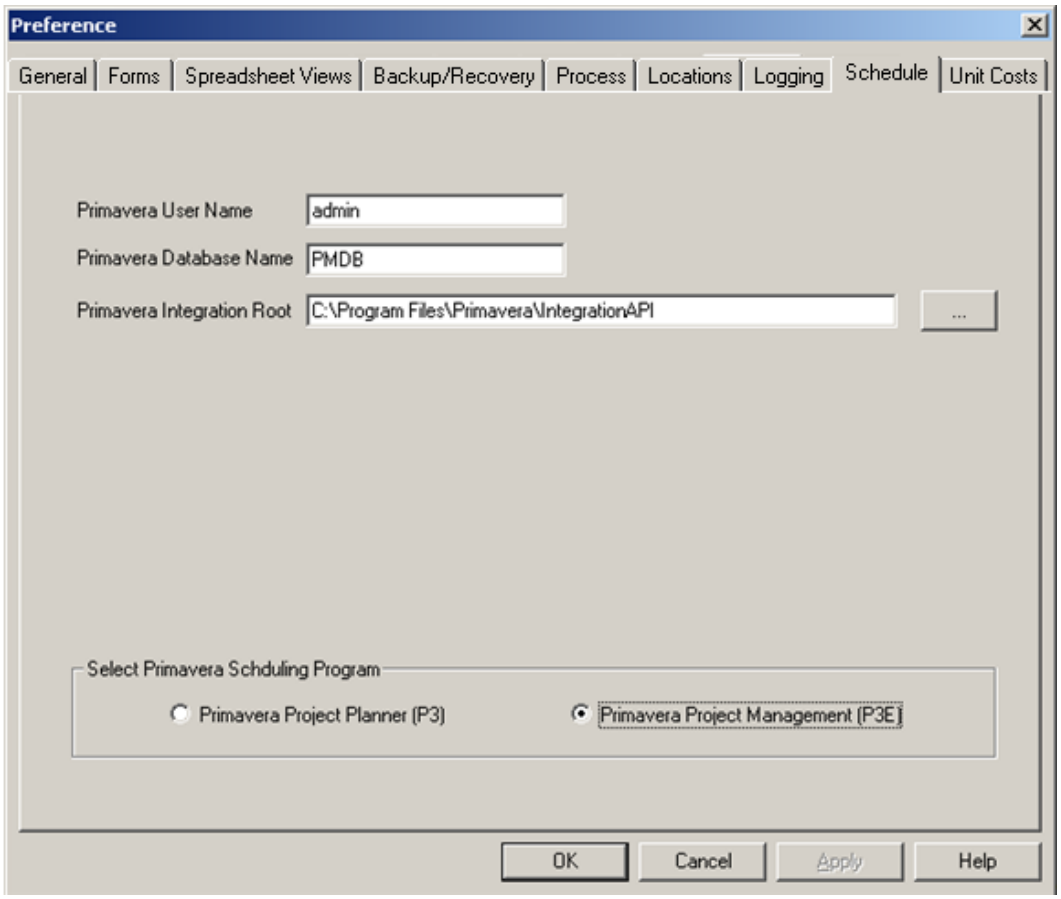
Schedule

Aspen In-Plant Cost Estimator supports Primavera Project Planner (P3) and Primavera Project Management (P3E) as the Scheduling program. It automatically detects if these applications are installed and displays the information on the **Schedule** tab.

P3E is selected by default as the Scheduling program if both P3E and P3 are installed. However, you can change this default selection by specifying your choice on the **Schedule** tab.

For P3E, You can specify:

- Primavera User Name
- Primavera Database Name
- Primavera Integration Root



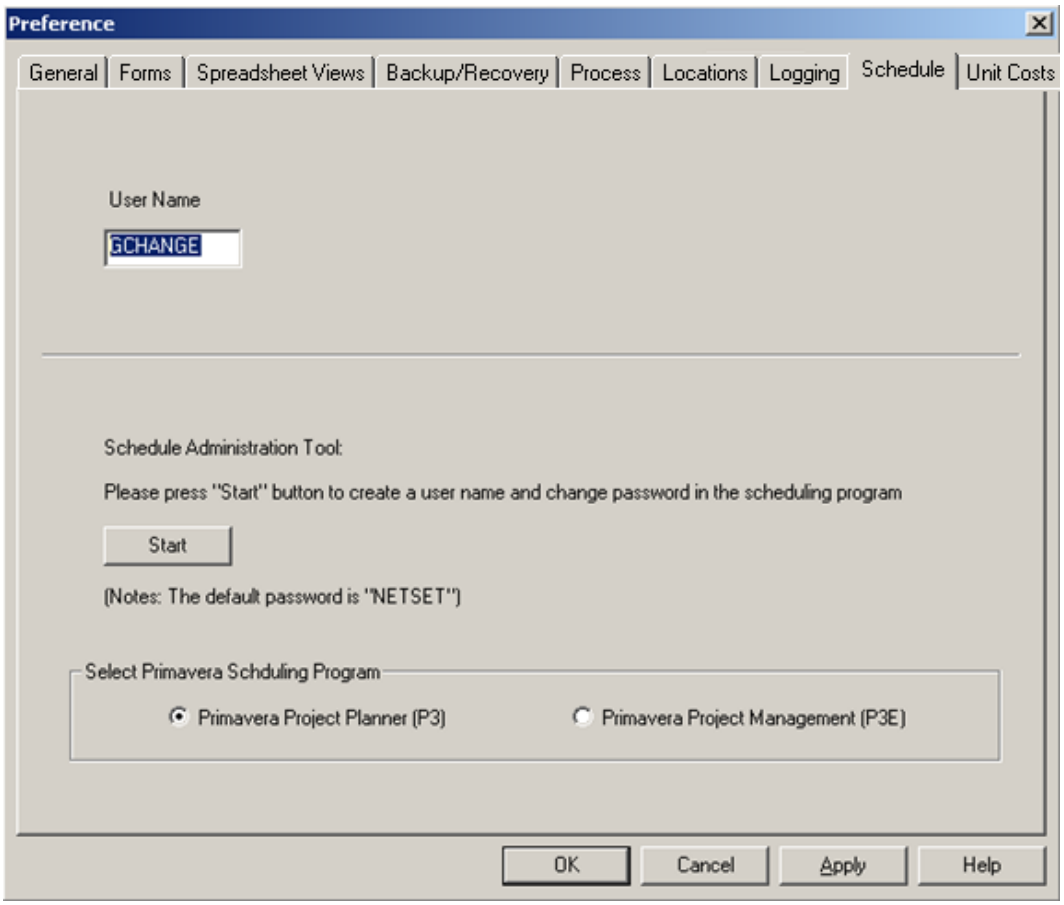
In the **Schedule** tab view, you can specify your Primavera user name.

The **Schedule** tab view also contains the Schedule Administrator Tool for registering users and access rights in cases where Aspen In-Plant Cost Estimator and the scheduling program run on a network. It should only be used by a network administrator.

For P3, you can specify:

- Primavera User Name

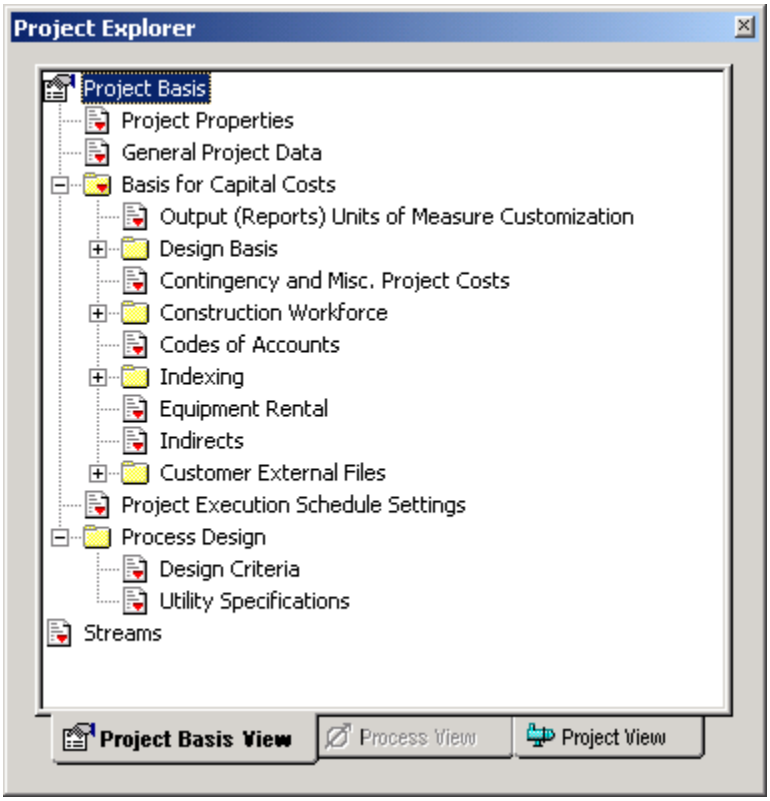
Note: The **Schedule** tab also contains the Schedule Administrator Tool for registering users and access rights in cases where Aspen In-Plant Cost Estimator and the scheduling program run on a network. It should only be used by a network administrator.


Preference
General
Forms
Spreadsheet Views
Backup/Recovery
Process
Locations
Logging
Schedule
Unit Costs
User Name
GCHANGE
Schedule Administration Tool:
Please press "Start" button to create a user name and change password in the scheduling program
Start
(Notes: The default password is "NETSET")
Select Primavera Schduling Program
Primavera Project Planner (P3)
Primavera Project Management (P3E)
OK
Cancel
Apply
Help

3 Defining the Project Basis

The Project Basis defines specifications that pertain to the overall project scenario. These specifications influence the design and cost estimate by defining system defaults and environmental variables.

Project Basis Specifications are accessed from the Project Basis view in Project Explorer.

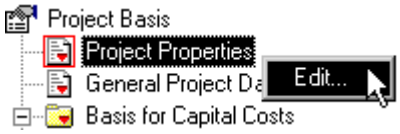


A red arrow on an icon indicates that you can right-click on the item to access a pop-up menu.

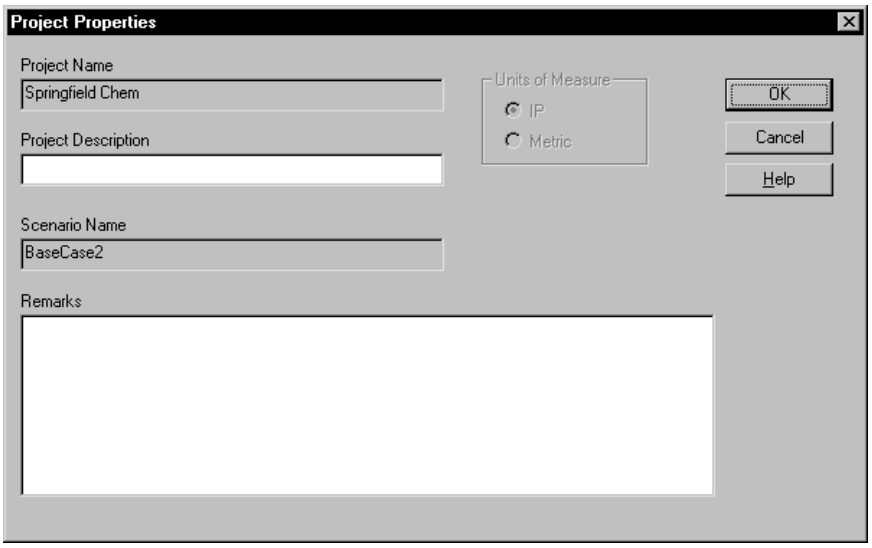
This chapter describes the different Project Basis specifications, as well as how to customize specification libraries.

Project Properties

Project Properties are initially specified when creating a new project. To access, right-click on Project Properties in the main Project Basis folder, and then click Edit.



The Project Properties dialog box appears.



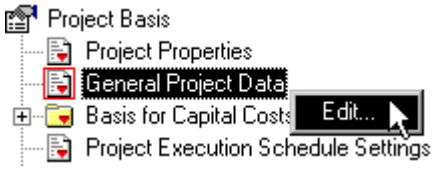
You cannot edit Project Name, Scenario Name, or Units of Measure; they can only be specified when creating a new project.

You can edit the following:

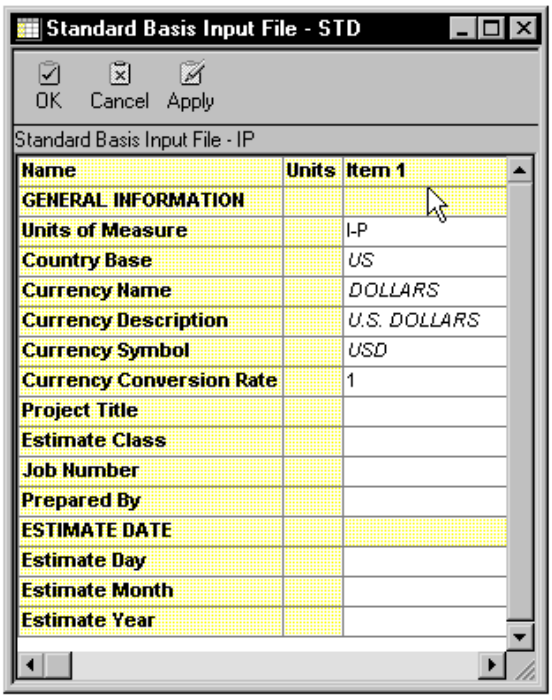
- **Project Description:** The description can be up to 500 characters in length and can be comprised of letters, numbers, and punctuation. All scenarios under the project share the description entered in this field.
- **Remarks:** Your remarks can be up to 6,000 characters in length and can be comprised of letters, numbers, and punctuation. Remarks might include, for example, the intended purpose of the estimate, executive summary of results, or an explanation of assumptions.

General Project Data

General Project Data is initially specified when creating a project. To access, right-click on General Project Data in the main Project Basis folder, and then click Edit on the pop-up menu.



The Standard Basis Input File Specifications form appears.



You cannot edit Units of Measure, Country Base, or Currency Symbol; they can only be specified when creating a new project.

You can edit the following:

- **Currency Conversion Rate:** Specifies the number of currency units per one country base currency unit. This is for when you are using a currency other than that of the country base.
- **Project Title:** Appears as the project name on reports generated by Aspen Icarus Reporter.
- **Estimate Class:** Intended to indicate the purpose of specifications (for example, budget). Appears only as a reference on this specifications form, not on any reports.
- **Job Number:** Appears only as a reference on this specifications form, not on any reports.
- **Prepared By:** Appears at the top of reports generated by Aspen Icarus Reporter.
- **Estimate Date:** Appears only as a reference on this specifications form. Reports generated by Aspen Icarus Reporter include an Estimate Date, but Aspen Icarus Reporter automatically uses the date on which the project evaluation was run.

Basis for Capital Costs

The Basis for Capital Costs includes:

- Units of measure customization.

- General mechanical design rules for equipment, piping (general, material and custom), civil, steel, instrumentation, electrical, insulation and paint.
- Project costs for field supervision, domestic freight, taxes, permits, engineering, construction overhead, fees and contingency.
- Workforce wage rates (globally and by craft), productivities, workweek, overtime, crew mixes, and craft names.
- Code of account (COA) re-definitions, additions and allocations.
- Indexing of material costs and man-hours by COA.
- Construction equipment rental items, rates, and durations.
- Indirect costs.

Input Units of Measure Customization

Input Units of Measure Customization lets you customize the units of measure that appear on specification forms.

This basis can only be accessed from the Palette's Libraries view with no project open. It does not appear in the Project Explorer's Project Basis view.

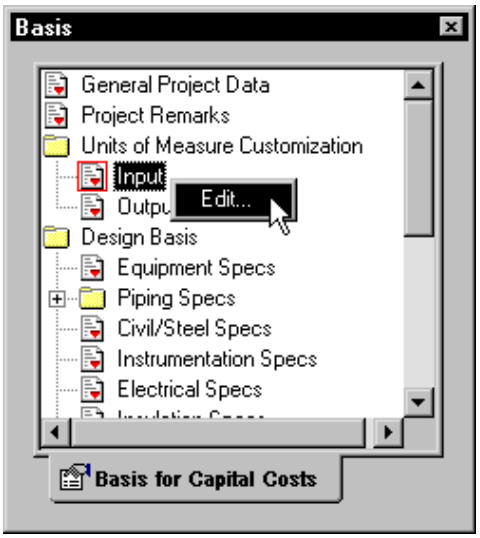
To customize input units of measure:

1 With no project open, expand the **Basis for Capital Costs** folder in the Palette's **Libraries** view. Expand the appropriate units of measure basis folder – Inch-Pound or Metric. Right-click on one of the specification files and click **Modify**.

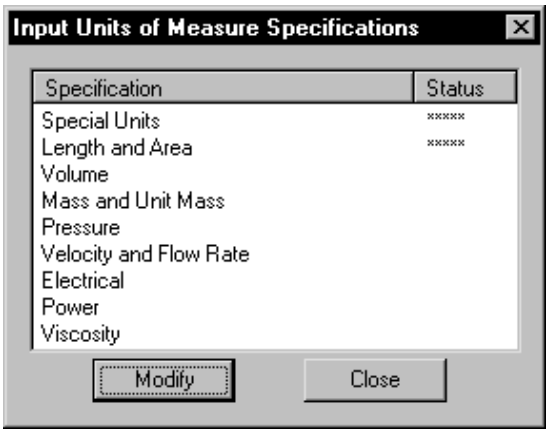
Note: If you are modifying a file you will need to later select the file in the project. To do so, right-click on Basis for Capital Costs in the Project Explorer's Project **Basis** view, click **Select**, and select the file.

Aspen In-Plant Cost Estimator displays the Basis for Capital Costs library in Project Explorer.

2 In the **Units of Measure Customization** folder, right-click **Input**; then on the pop-up menu, click **Edit**.



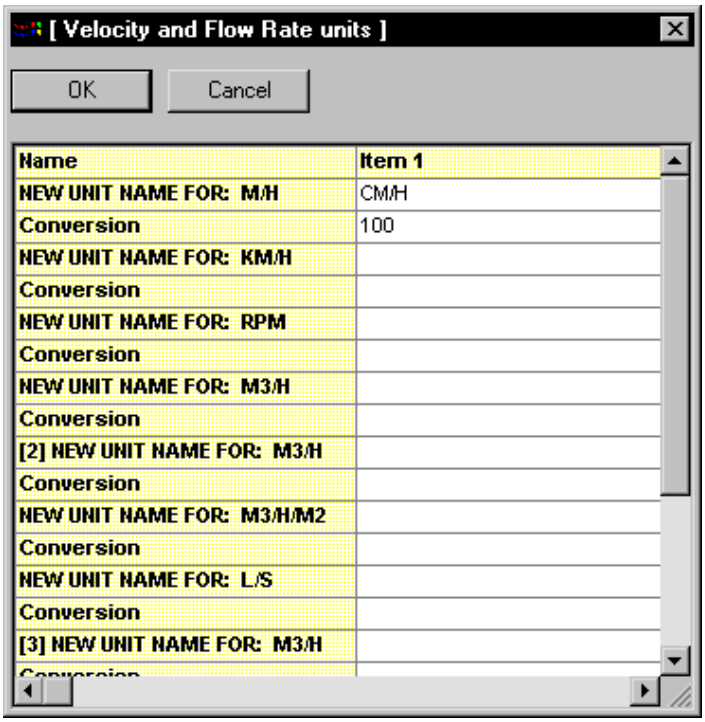
The **Input Units of Measure Specifications** dialog box appears.



3 If, for example, you want to use CM/H (centimeters per hour) instead of M/H (meters per hour) to specify conveyor belt speed in your metric-basis project, click Velocity and Flow Rate and then click Modify.

4 On the Velocity and Flow Rate Units form, enter "CM/H" as the new unit name for M/H. Then enter the conversion factor between the two units in the Conversion field. In this example, the conversion factor between the two units is 100 because:

100 CM/H = 1 M/H.



5 Click **OK** to accept the modifications and return to the previous dialog box.

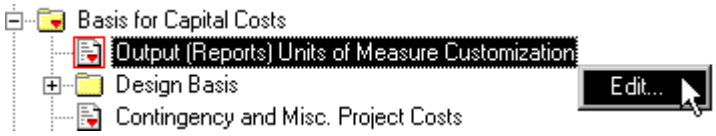
6 When finished modifying input units of measure, click **Close**.

Output (Reports) Units of Measure Customization

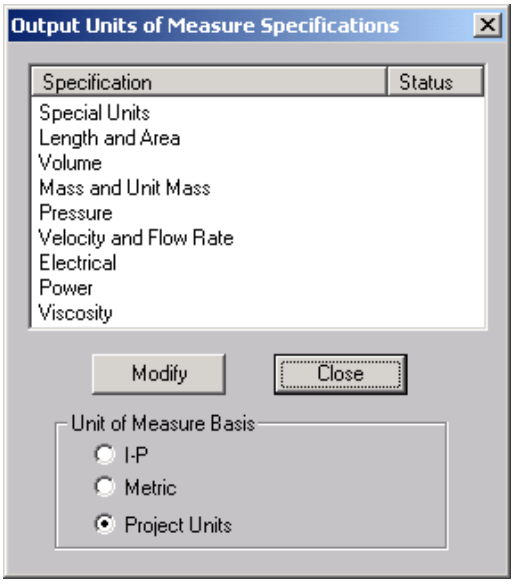
Output (Reports) Units of Measure Customization lets you customize the units of measure that appear on reports.

To customize output units of measure:

1 Right-click on Output (Reports) Units of Measure Customization in the Basis for Capital Costs folder in Project Explorer's Project Basis view, and then click Edit on the pop-up menu.

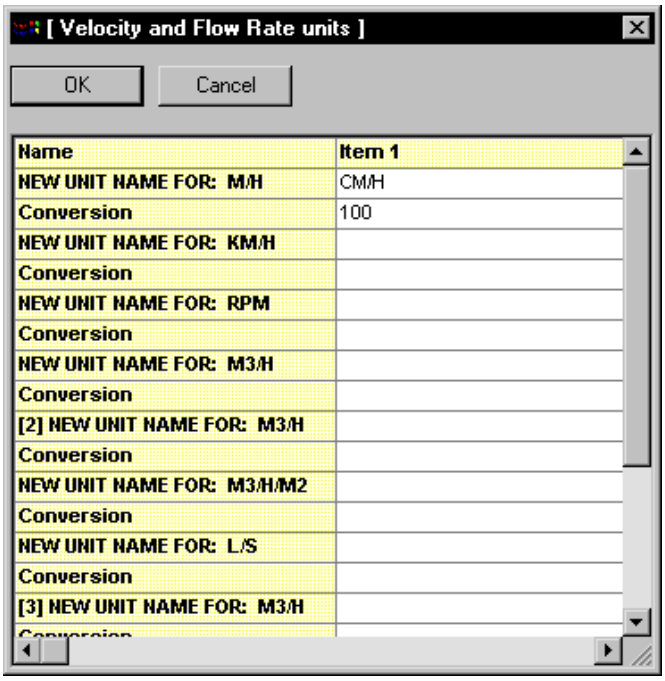


The **Output Units of Measure Specifications** dialog box appears.



2 You can change the basis for all output units of measure by selecting a different basis in the Unit of Measure Basis section; however, note that this voids all previous customizations.

- To customize only individual units, such as velocity and flow rate units, select the unit type and click Modify. Then, for each unit you wish to change, enter the new unit name and the conversion factor (between the old and new units).



In this example, centimeters per hour (CM/H) replaces meters per hour (M/H). A conversion factor of 100 has been entered because 100 CM/H = 1 M/H.

- For example, if you want to use CM/H (centimeters per hour) instead of M/H (meters per hour) to specify conveyor belt speed in your metric-basis project, enter "CM/H" as the new unit name for M/H. Then, enter the conversion factor between the two units in the Conversion field. In this example, the conversion factor between the two units is 100 because 100 CM/H = 1 M/H.

3 Click **OK** to accept the modifications and return to the previous dialog box. When finished modifying output units of measure, click Close.

Design Basis

Design Basis defines the general mechanical design rules for the entire project. Aspen In-Plant Cost Estimator uses built-in, industry-standard design procedures for the preparation of mechanical designs. The standards used include ASME (American Standards), BS5500 (British Standards), or JIS (Japanese Standards), DIN (German Standards) and EN 13445 (European Standards).

Design Basis influences the way Aspen In-Plant Cost Estimator evaluates all components of the facility (for example, equipment and bulk items — materials, manpower and indirects) and lets you define custom pipe specifications.

Aspen In-Plant Cost Estimator uses default values if Design Basis information is not specified. The default values depend upon the selected country base.

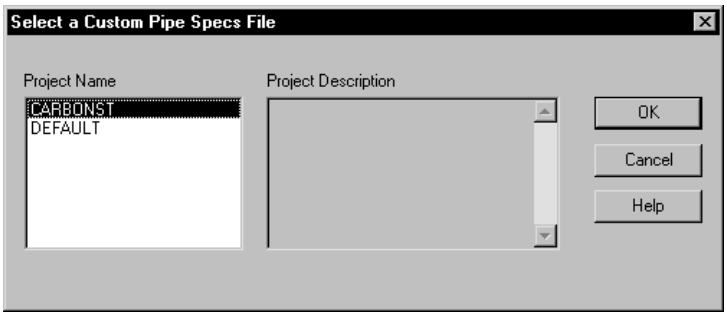
Design Basis specifications are divided into the following categories:

- **Equipment Specs**

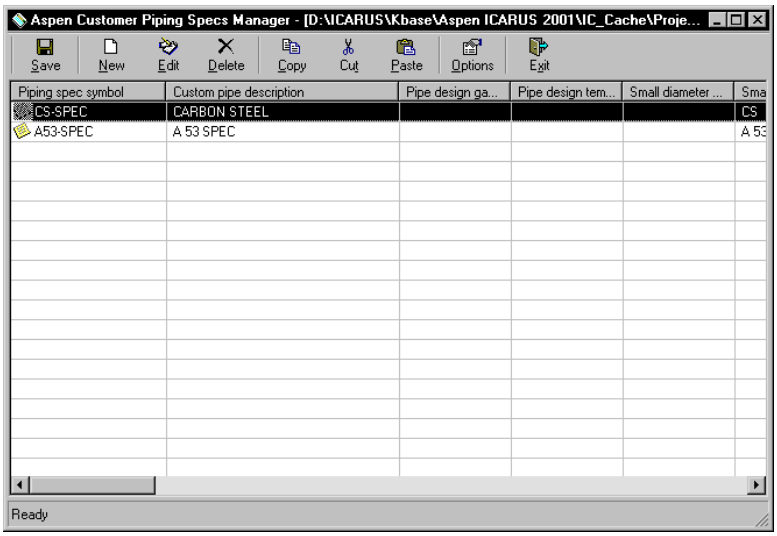
Equipment design specifications include design code for pressure vessels, size limits for shop fab equipment, maximum diameter of vessels fabricated using pipe, maximum horizontal deflection of vessels as a percentage of vessel height, when to apply vessel stress relief (always, never, or when required by code), whether to use welded or seamless tubes for heat exchangers and reboilers, and which equipment to use for heavy lifting (gin poles or cranes).

- **Piping Specs**
  - **General:** Design specifications for all piping.
  - **Material:** Design specifications for specific piping material. The information entered here lets you redefine default specifications for any system material. For example, if you define a material and later select that material when defining installation piping for a component, your material specifications are used instead of the system default specifications.
  - **Custom:** Custom piping specifications. These specifications may consist of your company's standard piping specifications or simply the most commonly used specifications for pipe on the current project.

To use custom piping, you have to first select a file. To do so, right-click on Custom in the Piping Specs folder, and then click select on the pop-up menu.



Aspen In-Plant Cost Estimator provides two custom pipe specs files to help you get started: CARBONST.DAT and DEFAULT.DAT. After selecting a file, right-click on Custom and click Edit to access the Aspen Customer Piping Specs Manager.



Each specification in the set consists of a 1-8 alpha/numeric character custom pipe symbol followed by a definition for how to design pipe using this spec. (Refer to the flowcharts in *Icarus Reference*, Chapter 18, for information on developing various aspects of piping.)

Click New on the Customer Piping Specs Manager to add a custom pipe specification. You can have a maximum of 100 custom piping specs per project and 600 in one file.

- **Civil/Steel Specs**

  Civil and Steel design specifications include wind data, seismic data, comprehensive strength, concrete ready-mix costs, concrete overpour percentage, rebar type and cost, seal slab thickness, number of formwork reuses, concrete type (standard, higher grade, or chemical-resistant), structure analysis type, structural steel grade, unit cost and percent of purchased backfill when used in place of excavated soil, excavation slope ratio, steel finish type (painted or galvanized) and steel galvanizing cost per weight unit.

- **Instrumentation Specs**

  Instrumentation design specifications, including instrumentation type (electronic or pneumatic) and specifications for instrument transmission and thermocouple transmission: control valve type, control valve positioner, control valve position switch, temperature element type, flow element type, instrument transmitter type, distance from component to junction box, whether to exclude air regulators if low pressure air is available, control valve center type (analog, digital, or none), and whether to have a conventional 4-20 mA wired system or a digital Fieldbus system.

  Unlike a 4-20 mA system in which each instrument in the field requires its own set of wires to run to the local junction box and back to the control center, a Fieldbus system allows multiple instruments to share one set of cables. The Fieldbus systems are designed based on the distances involved (cable length), number of field instruments, instrument type, and power requirements.

  If you select to use a **Fieldbus** system, also select, in the **Connection Type** box, the type of bricks and cable termination. Select "SC" for spring

clamp connections. Select "ST" for screw terminal bricks and terminations. Both "SC" and "ST" use standard instrument cable. Select "MP" for a system designed with cable that is pre-cut and molded with pluggable terminations (and bricks with pluggable terminals). "MP" does not require installation hours to connect "pig-tail" terminations – the cables snap onto the bricks. An "MP" implementation requires the purchase of one pluggable device gland per instrument.

In an explosion-proof area, the **Fieldbus** system will consist of bricks and power supply units that are rated for intrinsically safe applications (I.S.-rated non-pluggable components by Hawke International). You can also, if using a **Fieldbus** system, select to include Fieldbus short-circuit protection for each "spur" in the Fieldbus segments. For 3-drop bricks, the short-circuit protection units are purchased separately; for all bricks of larger size, short-circuit protection is incorporated within the brick itself (if selected).

For the **Fieldbus** system, you can also specify:

- Whether the fieldbus has short circuit protection (area or project level)
- The percent of active bricks (area level only)
- Whether the fieldbus has a backup power supply (area or project level)

You can override these project-level instrumentation specs for a particular area when defining an area (see page 185). For example, you can select to use a Fieldbus system in the Design Basis, but then make an exception for one area by selecting the conventional 4-20 mA wired system in the area's instrumentation specs.

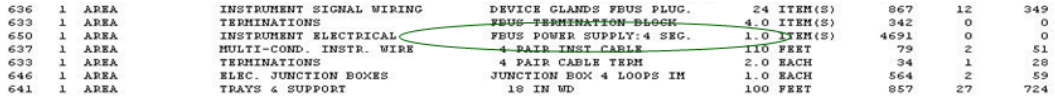
Fieldbus short-circuit protection can be defined at the project-level or the area-level.

Notes:

- The **percent of active bricks** can be specified at the area level only.
- When you specify a **percent active brick** value for the **MP** connection type, two cost lines are generated:
  - Bricks with short circuit protection
  - Bricks without short circuit protection.
- For **molded pluggable connection** types with **short circuit protection** specified as **Y**, the brick as a whole has short circuit protection capability.
- For **Spring clamp/screw terminal connection** types with **short circuit protection** specified as **Y**, the short circuit protection capability is in the connection between the field devices and the bricks. When you specify a **percent active brick** value for these two connection types, the following cost lines are generated:
  - Field bus screw terminal brick (for **Screw terminal** type)
    or
  - Field bus spring clamp brick (for **Spring clamp** type)
    and
  - Field bus short circuit protection (for **Spring clamp/Screw** terminal type)

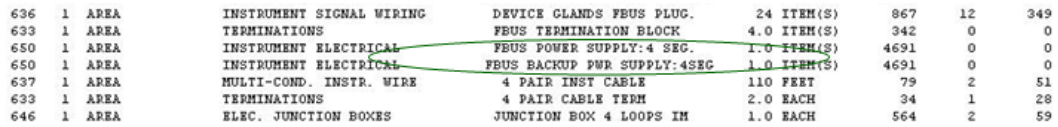
Effect of Selecting Backup Power Supply Required (General Instrument Specs form):

- If you select that no backup power supply is required (the default), the generated report appears as follows, with one **Fieldbus** item:



636	1	AREA	INSTRUMENT SIGNAL WIRING	DEVICE GLANDS FBUS PLUG.	24 ITEM(S)	867	12	349
633	1	AREA	TERMINATIONS	FBUS TERMINATION BLOCK	4.0 ITEM(S)	342	0	0
650	1	AREA	INSTRUMENT ELECTRICAL	FBUS POWER SUPPLY:4 SEG.	1.0 ITEM(S)	4691	0	0
637	1	AREA	MULTI-COND. INSTR. WIRE	4 PAIR INST CABLE	110 FEET	79	2	51
633	1	AREA	TERMINATIONS	4 PAIR CABLE TERM	2.0 EACH	34	1	28
646	1	AREA	ELEC. JUNCTION BOXES	JUNCTION BOX 4 LOOPS IM	1.0 EACH	564	2	59
641	1	AREA	TRAYS & SUPPORT	18 IN WD	100 FEET	857	27	724

- If you select that backup power supply **is** required, the generated report appears as follows, with two identical **Fieldbus** items:



636	1	AREA	INSTRUMENT SIGNAL WIRING	DEVICE GLANDS FBUS PLUG.	24 ITEM(S)	867	12	349
633	1	AREA	TERMINATIONS	FBUS TERMINATION BLOCK	4.0 ITEM(S)	342	0	0
650	1	AREA	INSTRUMENT ELECTRICAL	FBUS POWER SUPPLY:4 SEG.	1.0 ITEM(S)	4691	0	0
650	1	AREA	INSTRUMENT ELECTRICAL	FBUS BACKUP PWR SUPPLY:4SEG	1.0 ITEM(S)	4691	0	0
637	1	AREA	MULTI-COND. INSTR. WIRE	4 PAIR INST CABLE	110 FEET	79	2	51
633	1	AREA	TERMINATIONS	4 PAIR CABLE TERM	2.0 EACH	34	1	28
646	1	AREA	ELEC. JUNCTION BOXES	JUNCTION BOX 4 LOOPS IM	1.0 EACH	564	2	59

- **Electrical Specs**

  Electrical design specifications include power supply frequency, class and division or zone, whether to use 3- or 4-wire distribution system, voltage levels, wire specifications at the different voltage levels, and cable placement.

- **Insulation Specs**

  Insulation design specifications, including thickness schedule, minimum temperature for hot insulation, equipment insulation type, equipment insulation jacket type, fire resistance rating for fireproofing on skirts, equipment fireproofing type, whether to include fireproofing on the outside or both sides of skirts, steel fire resistance fireproof rating, and steel fireproofing type, coverage, and installation (field or remote shop).

  You can specify a named insulation library for a project for a particular use.

  You can specify a named insulation library for an area for a particular use.

  You can create, duplicate, modify and delete:

  - Hot Insulation Schedule libraries
  - Cold Insulation Schedule libraries
  - Libraries of Insulation Equivalent Length rules

  You can create any number of **Hot Insulation Schedule** libraries with one insulation specification table/file. Each library has a name associated to it. You can use **20 Hot Insulation Schedule** tables in a project.

  Hot Insulation Schedule files are named:

  INSHOT##.DAT, where ## is the number (up to 20) of the Hot Insulation Schedule file.

  You can create any number of **Cold Insulation Schedule** libraries with one insulation specification table/file. Each library has a name associated to it. You can use **ten Cold Insulation Schedule** tables in a project.

  Cold Insulation Schedule files are named:

  INSCLD##.DAT, where ## is the number (up to 10) of the **Cold Insulation Schedule** file.

  You can create any number of **Insulation Equivalent Length** libraries with one insulation specification table/file. Each library has a name

associated to it. You can use **one Insulation Equivalent Length** table in a project.

Example File Format (one Table/File)

```
|VERSION_NUM|XXXX|
|Overall Units ->|IP    |
|Diameter Units->|INCH|
|C|TABLENAME   |
#NOMINAL
#  PIPE   |                   <------   Insulation Thickness (inch)   ------>                          |
#DIAMETER |                                                ( mm )                                    |
#|   |    |  1 | 1.5|  2 | 2.5|  3 | 3.5|  4 | 4.5|  5 | 5.5|  6 | 6.5|  7 | 7.5|  8 | 8.5|  9 | 9.5| 10 |
#|   |    | 25 | 38 | 50 | 63 | 75 | 88 | 100| 113| 125| 138| 150| 163| 175| 188| 200| 213| 225| 238| 250|
#|in | mm |----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|0.75| 20 |  50|  25| -10| -25| -70|-135|-225|-255|-300|-459|-459|-459|-459|-459|-459|-459|-459|-459|-459|
|1.00| 25 |  50|  25| -10| -25| -70|-130|-180|-255|-300|-459|-459|-459|-459|-459|-459|-459|-459|-459|-459|
|1.50| 40 |  50|  30|  15| -15| -45|-100|-120|-185|-230|-290|-345|-459|-459|-459|-459|-459|-459|-459|-459|
|2.00| 50 |  50|  30|  15| -15| -45| -90|-120|-185|-225|-290|-340|-459|-459|-459|-459|-459|-459|-459|-459|
|2.50| 65 |  50|  30|  15| -10| -35| -60|-105|-135|-175|-235|-290|-340|-459|-459|-459|-459|-459|-459|-459|
|3.00| 80 |  50|  30|  15| -10| -35| -60|-105|-135|-175|-235|-290|-340|-459|-459|-459|-459|-459|-459|-459|
|4.00| 100|  50|  30|  20|   0| -30| -55| -85|-135|-160|-205|-265|-300|-459|-459|-459|-459|-459|-459|-459|
|6.00| 150|  50|  45|  25|   0| -25| -45| -70|-105|-125|-160|-205|-240|-290|-325|-459|-459|-459|-459|-459|
|8.00| 200|  50|  45|  25|   0| -15| -35| -60| -85|-115|-145|-175|-215|-255|-295|-325|-459|-459|-459|-459|
|10.0| 250|  50|  45|  30|  10| -10| -25| -50| -70|-105|-125|-150|-185|-225|-235|-300|-459|-459|-459|-459|
|12.0| 300|  50|  45|  30|  15|  -5| -25| -45| -65|-105|-125|-140|-170|-205|-230|-285|-325|-459|-459|-459|
|14.0| 350|  50|  45|  30|  15|   0| -25| -40| -55| -80|-105|-130|-160|-190|-225|-265|-305|-325|-459|-459|
|16.0| 400|  50|  45|  30|  20|   0| -25| -35| -55| -75|-105|-125|-150|-180|-210|-250|-285|-310|-459|-459|
|18.0| 450|  50|  45|  30|  20|   0| -25| -35| -50| -70|-105|-115|-145|-175|-200|-235|-275|-295|-325|-459|
|20.0| 500|  50|  50|  30|  20|   0| -25| -35| -45| -65| -95|-110|-135|-165|-190|-225|-260|-290|-315|-459|
|22.0| 550|  50|  50|  30|  20|   0| -25| -35| -45| -65| -95|-105|-130|-155|-180|-205|-240|-270|-300|-459|
|24.0| 600|  50|  50|  30|  20|   0| -25| -35| -45| -65| -95|-105|-130|-155|-180|-205|-240|-270|-300|-459|
|26.0| 650|  50|  50|  30|  20|   5| -10| -25| -40| -60| -75|-105|-120|-140|-170|-190|-225|-250|-285|-459|
|28.0| 700|  50|  50|  30|  20|   5| -10| -25| -40| -60| -75|-105|-120|-140|-170|-190|-225|-250|-285|-459|
|30.0| 750|  50|  50|  30|  20|   5| -10| -25| -40| -60| -75|-105|-120|-140|-170|-190|-225|-250|-285|-459|
|36.0| 900|  50|  50|  30|  20|  10|  -5| -25| -40| -55| -75|-105|-115|-135|-160|-175|-215|-240|-280|-459|
# The last row (36 Inch) will be used by the system for Equipment Insulation
#-------------------------------------------------------------------------------------------------------
```

Example Insulation Equivalent Length Table

```
|VERSION_NUM|XXXX|
|Overall Units ->|IP    |
|Diameter Units->|INCH|
|E
#              EQUIVALENT LENGTH TABLE
#
# ************************************************************************
#  For both valves and fittings:
#
#      LENGTH = A + B*Pipe_Diameter^C
#
#  LENGTH is the length of pipe which would need to be insulated to equal
#  the insulation required for one valve/fitting.
# ************************************************************************
#
#|pipe |max  |      Valve      |     Fitting     |
#|size |diam |    Parameters   |    Parameters   |
#|cat. |in/mm|  A  |  B  |  C  |  A  |  B  |  C  |
#=================================================
| SMALL|  4  |  7  |  0  |  0  |  4  |  0  |  0  |
| MED. |  12 |  7  |  0  |  0  |  4  |  0  |  0  |
| LARGE|  24 |  7  |  0  |  0  |  4  |  0  |  0  |
#=================================================
```

The **Insulation Equivalent Length** libraries included in Aspen In-Plant Cost Estimator are named:

- Default

- INSSPC_BLANK
- INSSPC_IP
- INSSPC_METRIC

You can then specify in the project design basis insulation specifications using either the internal default **Hot Light**, **Medium**, or **Heavy** tables or you can specify a named insulation table to use as the default for all areas.

You can then specify in the project design basis insulation specifications either using the internal default **Cold** table or you can specify a named insulation table to use as the default for all areas.

You can then specify for each area **Hot** and **Cold** insulation specifications either an internal default table or you can specify a named insulation table to use.

To create a new Insulation Thicknesses and Rules Library:

1. On the Palette's **Libraries** tab, click **Customer External Files**.
2. On the **Customer External Files** dialog box, right-click **Insulation Thicknesses and Rules**.
3. On the dialog box that appears, click **New**.
4. On the New **Insulation Thicknesses and Rules** dialog box that appears, enter the name of the new library file and, optionally, a description of the new library file.
5. Click **OK**.

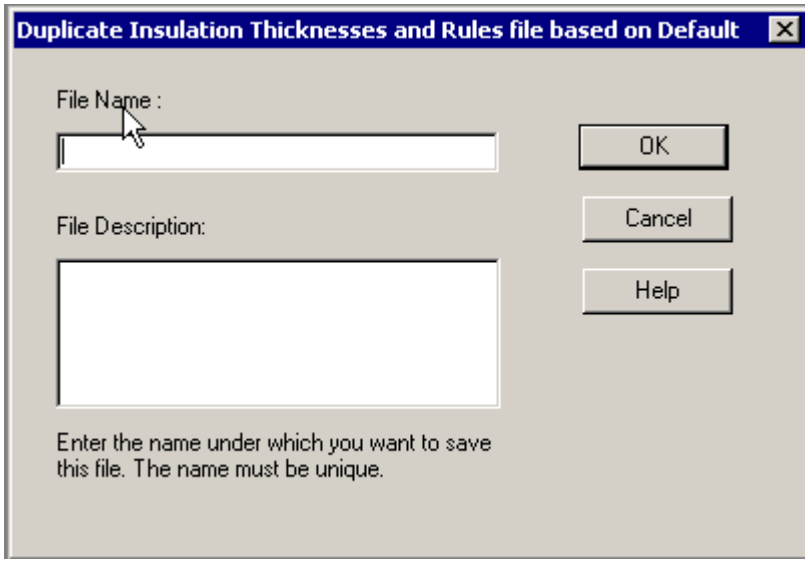
To Modify an Insulation Thicknesses and Rules Library:

1. On the Palette's **Libraries** tab, click **Customer External Files**.
2. On the **Customer External Files** dialog box, right-click **Insulation Thicknesses and Rules**.
3. Right-click the library file you want to modify.
4. On the **Insulation Thicknesses and Rules** dialog box that appears, enter your modifications.
5. Click **Modify**.

To Duplicate an Insulation Thicknesses and Rules Library:

1. On the Palette's **Libraries** tab, click **Customer External Files**.
2. On the **Customer External Files** dialog box, right-click **Insulation Thicknesses and Rules**.
3. Right-click the library file you want to duplicate.
4. On the **Insulation Thicknesses and Rules** dialog box that appears, click **Duplicate**.

The **Duplicate Insulation Thicknesses and Rules** dialog box appears.


Duplicate Insulation Thicknesses and Rules file based on Default
File Name :
OK
Cancel
File Description:
Help
Enter the name under which you want to save this file. The name must be unique.

5 In the **File Name** field, type the name of the file to be a duplicate of the one you are basing the duplicate on.

6 Click **OK**.

A duplicate file is created.

To Delete an Insulation Thicknesses and Rules Library:

1 On the Palette's **Libraries** tab, click **Customer External Files**.

2 On the **Customer External Files** dialog box, right-click **Insulation Thicknesses and Rules**.

3 Right-click the library you want to delete.

4 A warning appears asking whether you want to delete this library file. Click **Yes**.

The file is deleted.

To Create a New Hot or Cold Insulation Schedule File:

1 On the Palette's **Libraries** tab, click **Customer External Files**.

2 On the **Customer External Files** dialog box, right-click **Hot Insulation Schedule** or **Cold Insulation Schedule**.

3 On the menu that appears, click **New**.

4 On the **New [Hot/Cold Insulation Schedules]** dialog box that appears, enter the name of the new file and, optionally, a description of the new file.

5 Click **OK**.

To modify a Hot or Cold Insulation Schedule Library:

1 On the Palette's **Libraries** tab, click **Customer External Files**.

2 On the **Customer External Files** dialog box, right-click **Hot Insulation Schedule** or **Cold Insulation Schedule**.

3 Right-click the file you want to modify.

4 On the **External Insulation Specs** dialog box that appears, enter your modifications.

5 Click **Modify**.

To Duplicate a Hot or Cold Insulation Schedule Library:

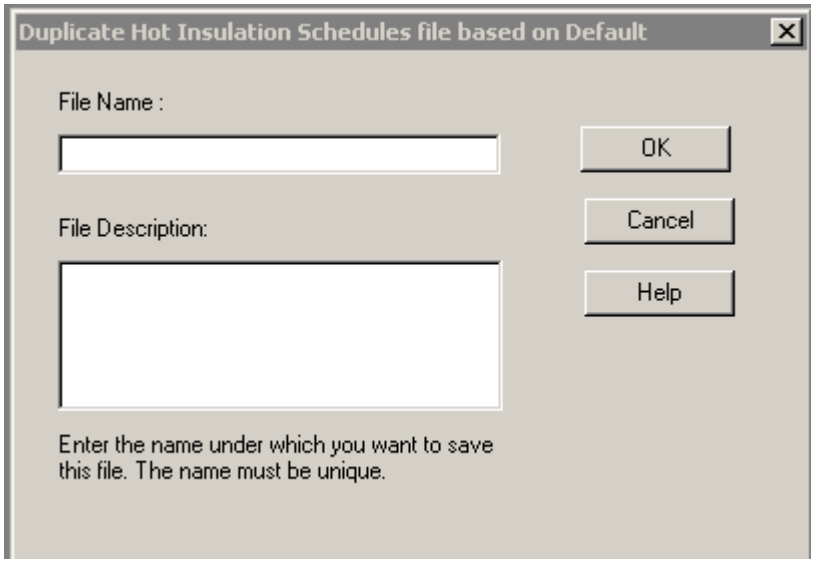
1 On the Palette's **Libraries** tab, click **Customer External Files**.

2 On the **Customer External Files** dialog box, right-click **Hot Insulation Schedule** or **Cold Insulation Schedule**.

3 Right-click the file you want to duplicate.

4 On the **Insulation Thicknesses and Rules** dialog box that appears, click **Duplicate**.

The **Duplicate Hot/Cold Insulation Schedules file** dialog box appears.


Duplicate Hot Insulation Schedules file based on Default
File Name :
OK
Cancel
File Description:
Help
Enter the name under which you want to save this file. The name must be unique.

5 In the **File Name** field, type the name of the file to be a duplicate of the one you are basing the duplicate on.

6 Click **OK**.

A duplicate file is created.

To Delete a Hot or Cold Insulation Schedule Library:

1 On the Palette's **Libraries** tab, click **Customer External Files**.

2 On the **Customer External Files** dialog box, right-click **Hot Insulation Schedule** or **Cold Insulation Schedule**.

3 Right-click the file you want to delete.

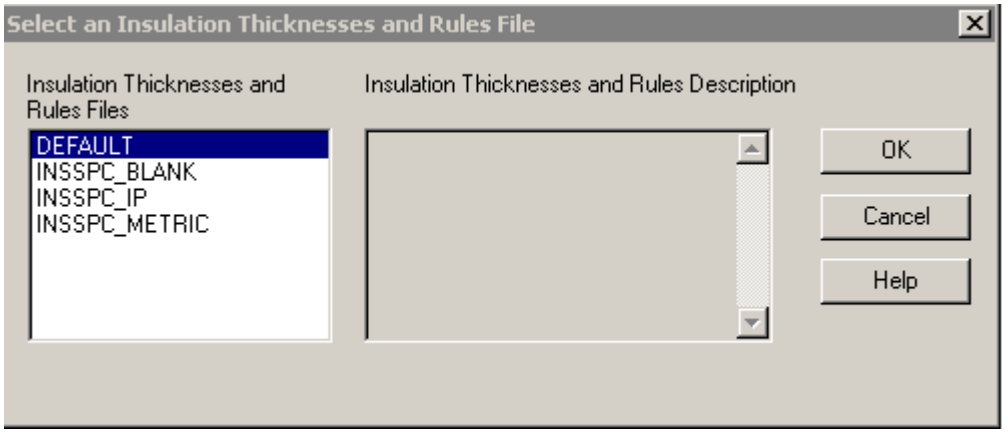
4 A warning appears asking whether you want to delete this library file. Click **Yes**.

The file is deleted.

To Use an Insulation Equivalent Length Rules Library in a Project:

1. On the **Project Basis** tab, click **Basis for Capital Costs | Customer External** Files.
2. On the **Customer External Files** folder, click the **Insulation External Files** folder.
3. On the **Insulation External Files** folder, right-click **Insulation Equivalent Length Rule**s.

The **Select an Insulation Thickness and Rules File** dialog box appears.

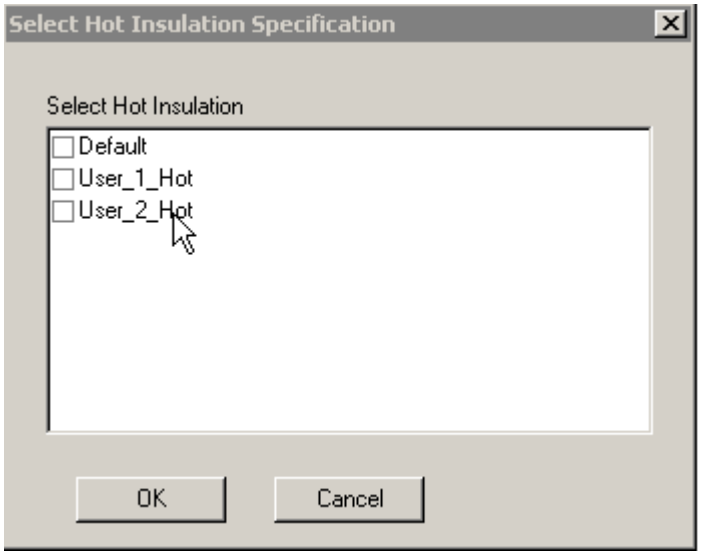


4. On the **Select an Insulation Thickness and Rules File** dialog box, select the file you want to use in the project.
5. Click **OK**.

To Use a Hot or Cold Insulation File in a Project:

1. On the **Project Basis** tab, click **Basis for Capital Costs | Customer External** Files.
2. On the **Customer External Files** folder, click the **Insulation External Files** folder.
3. On the **Insulation External Files** folder, right-click **Hot/Cold Insulation Schedules**.
4. Click **Select**.

The **Select Hot/Cold Insulation Specification** dialog box appears.



5 Select the insulation specification(s) that you want to include in the project. You can select up to 20 Hot Insulation specifications and up to 10 Cold Insulation specifications.

6 Click **OK**.

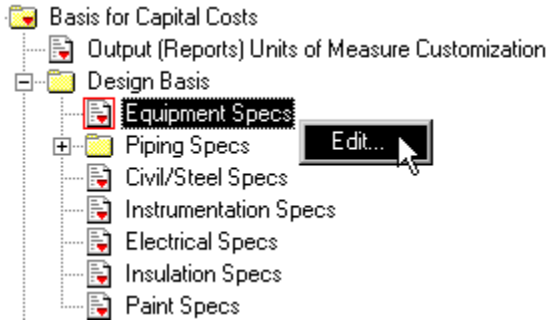
The specifications you selected are available in the project.

- **Paint Specs**

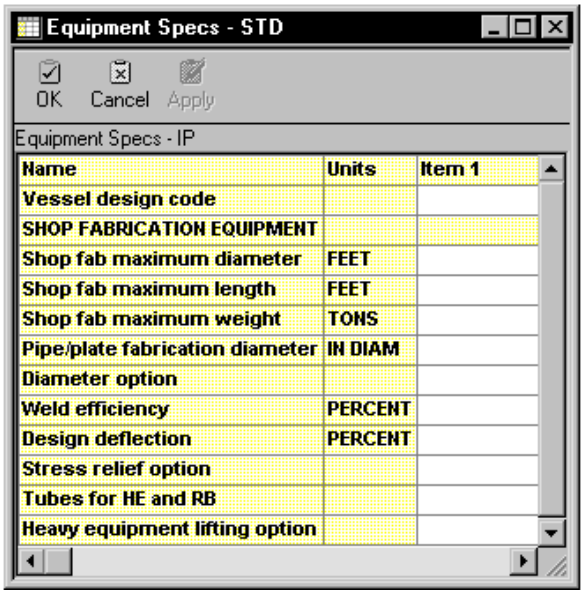
Paint design specifications include number of primer coats, number of finish coats, and whether painting is performed in field shop or remote shop.

To edit Design Basis specifications:

1 Right-click the specification category that you want to define, and then click **Edit** on the pop-up menu.



Aspen In-Plant Cost Estimator displays a specifications form for the selected category in the Main Window.



2 Enter the **Design Basis** specifications for the selected category.

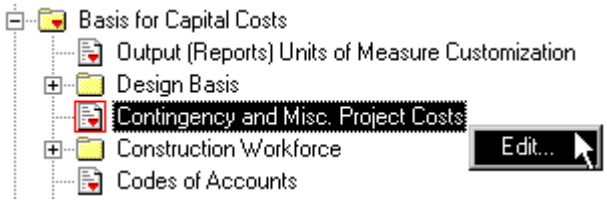
3 Click **OK** to add the specifications to the project and close the specifications form.

Contingency and Miscellaneous Project Costs

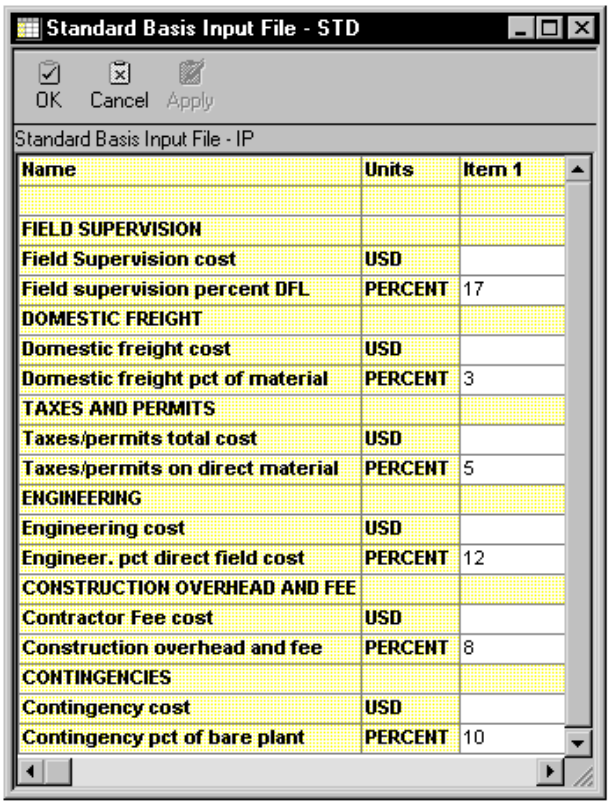
Contingency and Miscellaneous Costs include costs for field supervision, domestic freight, taxes and permits, engineering, construction overhead and fees, and contingency. These costs can be expressed as either a percentage of material or labor costs (depending on the cost item) or as a lump sum cost, but not both.

To define Contingency and Miscellaneous Project Costs:

1 In the **Basis for Capital Costs** folder, right-click **Contingency and Misc. Project Costs** and then click **Edit** on the pop-up menu.



Aspen In-Plant Cost Estimator displays the cost specifications in the Main Window.



Name	Units	Item 1
FIELD SUPERVISION		
Field Supervision cost	USD	
Field supervision percent DFL	PERCENT	17
DOMESTIC FREIGHT		
Domestic freight cost	USD	
Domestic freight pct of material	PERCENT	3
TAXES AND PERMITS		
Taxes/permits total cost	USD	
Taxes/permits on direct material	PERCENT	5
ENGINEERING		
Engineering cost	USD	
Engineer. pct direct field cost	PERCENT	12
CONSTRUCTION OVERHEAD AND FEE		
Contractor Fee cost	USD	
Construction overhead and fee	PERCENT	8
CONTINGENCIES		
Contingency cost	USD	
Contingency pct of bare plant	PERCENT	10

2 Enter the cost specifications.

3 Click **OK** to add the specifications to the project and close the specifications form.

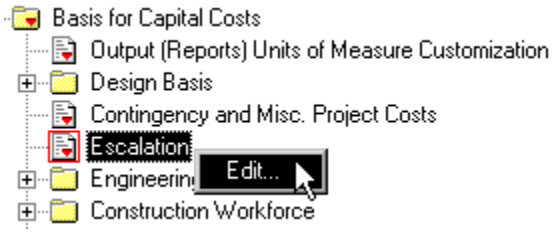
Escalation

Escalation provides the ability to incorporate the effects of the constantly changing local and world economies. The **Escalation** feature lets you specify escalation indices for the following material and labor cost categories:

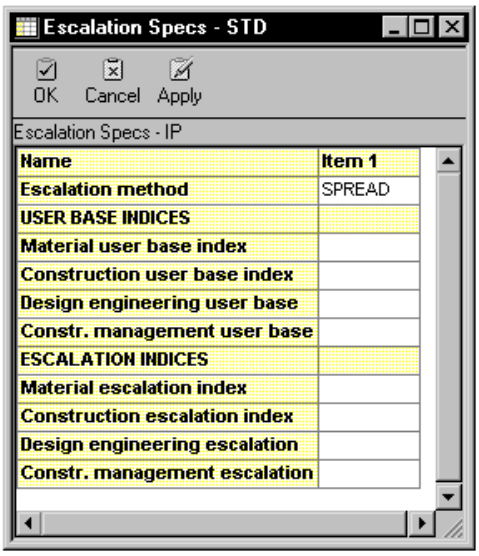
- General materials
- Design engineering
- Construction manpower
- Construction management

To define escalation:

1 Right-click on **Escalation** in the **Basis for Capital Costs** folder; then click **Edit**.



Aspen In-Plant Cost Estimator displays the **Escalation Specs** dialog box in the Main Window.



2 In the **Escalation Method** field, you can choose one of two ways for reporting escalated costs:

Click	to
SPREAD	Define escalation to be included in all reported costs.
ACCUM	Define escalation to be segregated from all costs and to be accumulated (into each of the four categories above) for summary reporting, and with costs to be reported at a user-defined condition.

Note: The system base indices are published in *Icarus Reference*.
All user-entered costs (quoted cost items, quoted equipment costs, library items, material/labor lump sum additions, project indirects, and so on) are assumed to be valid at the *user base* time point. This may be a corporate-standard time point chosen as a basis for all projects.

Three indices are used to develop escalated costs:

- System Base Indices (SBI): System-defined indices that represent costs inherent to the particular version of the system.
- User Base Indices (UBI): User-entered indices that reference user-entered cost values. All system-developed costs (developed at SBI) are adjusted to UBI by multiplying the ratio (UBI/SBI).
- Escalation Indices (EI): User-entered indices that escalate all costs (both user-entered and system-generated) from the user base (UBI) to some other point in time. This is done by multiplying all costs by the ratio (EI/UBI).

3 Enter or revise your specifications.

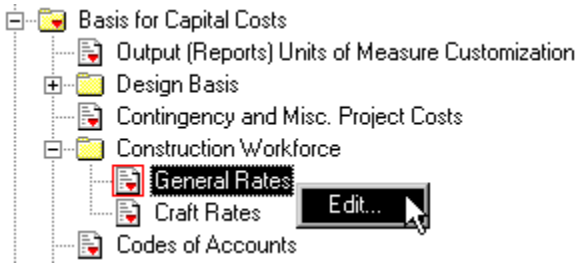
4 Click **OK** to apply your specifications to the project and close the specifications form.

Construction Workforce

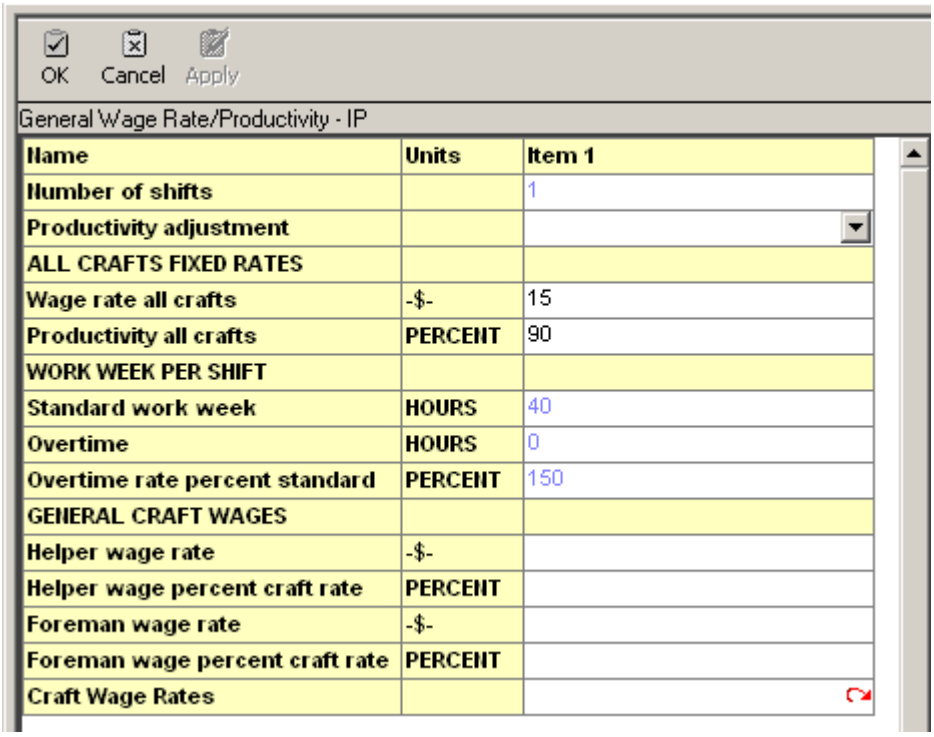
Construction Workforce specifications are divided into General Rates and Craft Rates.

General Rates

The General Wage Rates information globally sets wage rates and productivities for all crafts. To access, right-click on General Wage Rates in the Project Basis view's Construction Workforce folder, and then click Edit on the pop-up menu.



Aspen In-Plant Cost Estimator displays the **General Wage Rate/Productivity** specifications form in the Main Window.



Name	Units	Item 1
Number of shifts		1
Productivity adjustment		
ALL CRAFTS FIXED RATES		
Wage rate all crafts	-$-	15
Productivity all crafts	PERCENT	90
WORK WEEK PER SHIFT		
Standard work week	HOURS	40
Overtime	HOURS	0
Overtime rate percent standard	PERCENT	150
GENERAL CRAFT WAGES		
Helper wage rate	-$-	
Helper wage percent craft rate	PERCENT	
Foreman wage rate	-$-	
Foreman wage percent craft rate	PERCENT	
Craft Wage Rates		

Descriptions of the **General Wage Rate/Productivity** specifications follow.

Field	Description
Number of shifts	Number of shifts used during construction. If any premium pay is involved with second and third shift work (beyond overtime pay), such premium should be indicated by a properly averaged craft rate per shift.
Productivity adjustment	Specifies whether to use multi-shift/workweek adjustments or not.

All Crafts Fixed Rates

This input may be used to globally set the wage rates and productivities of all crafts in this workforce to fixed values.

Wage rate all crafts	Specifies the fixed wage rate (in the project currency) for all crafts in the workforce.
Productivity all crafts	Specifies the fixed productivity value for all crafts in this workforce. If no value is specified, the system defaults to 100%.

Work Week Per Shift

Refer to the description of workforces in *Icarus Reference* for the effect of changing the work week and number of shifts upon productivity and job duration. The standard work week plus overtime must not exceed 84 hours per week per shift.

Standard work week	Specifies number of standard hours per week per man per shift.
Overtime	Specifies number of overtime hours per week per man per shift.
Overtime rate percent standard	Specifies overtime pay expressed as a percentage of standard pay (for example, time and one half = 150%).

General Craft Wages

The general craft wages are for crafts that could appear in most crews and whose productivities and/or wage rates are dependent on the type of crew.

Helper wage rate	UK Base only. Specifies wage rate for craft help as a fixed rate to be used in all crews.
Helper wage percent craft rate	UK Base only. Specifies the wage rate for craft help as a percent of the principal craft in the crew. This value must be less than 100%.
Foreman wage rate	Specifies the wage rate for foremen as a fixed rate to be used in all crews. Default: 110% of rate of highest paid craft in crew.
Foreman wage percent craft rate	Specifies the wage rate for foreman as a percent of the highest paid craft in crew. This value must be greater than or equal to 100%. Default: 110% of rate of highest paid craft in crew.
Craft Wage Rates	Craft Rates set the wage rate and productivity individually for each craft.

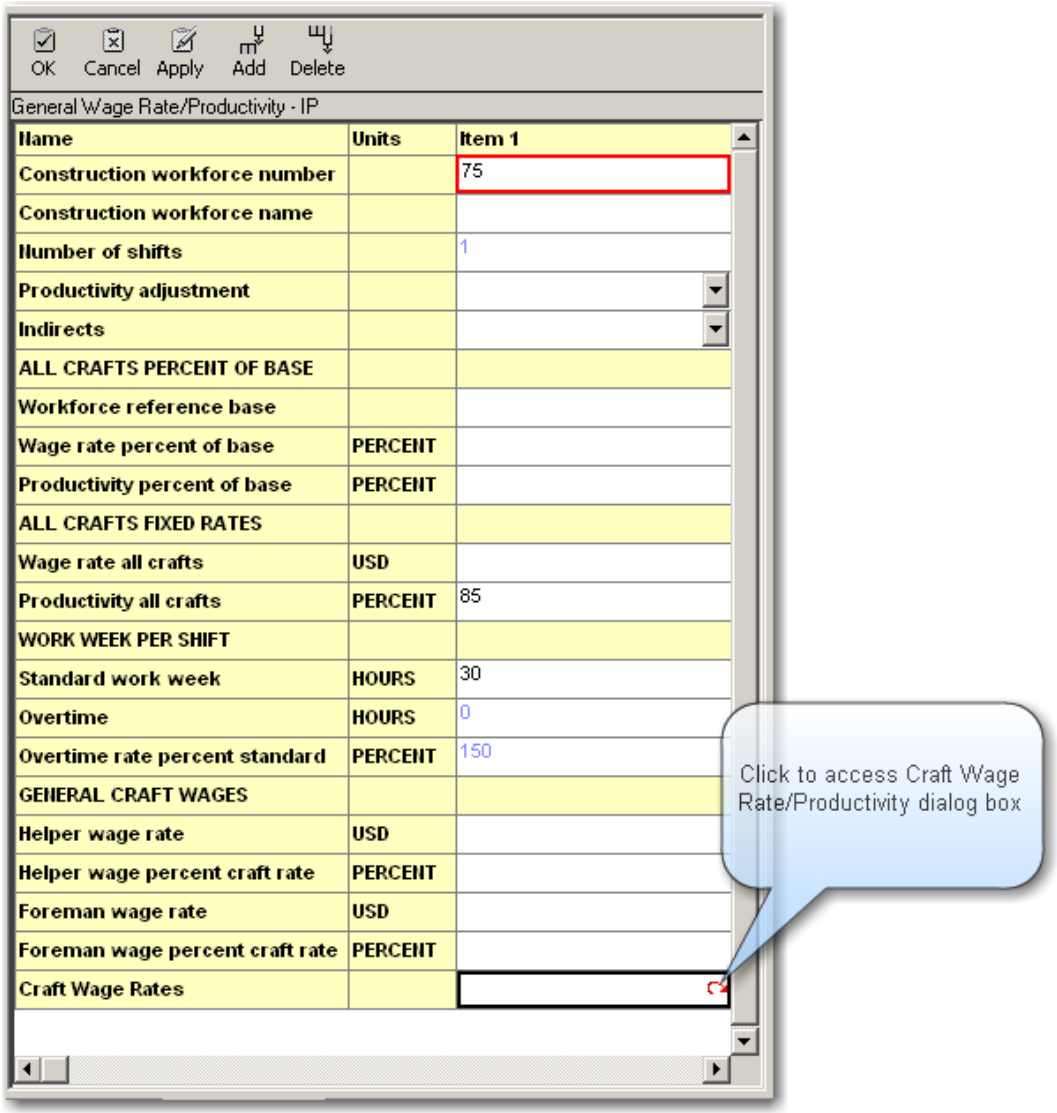
Field	Description
	Note: Right-click the red arrow to define craft rates for a construction workforce. You can define up to 99 separate construction workforces.

Craft Rates

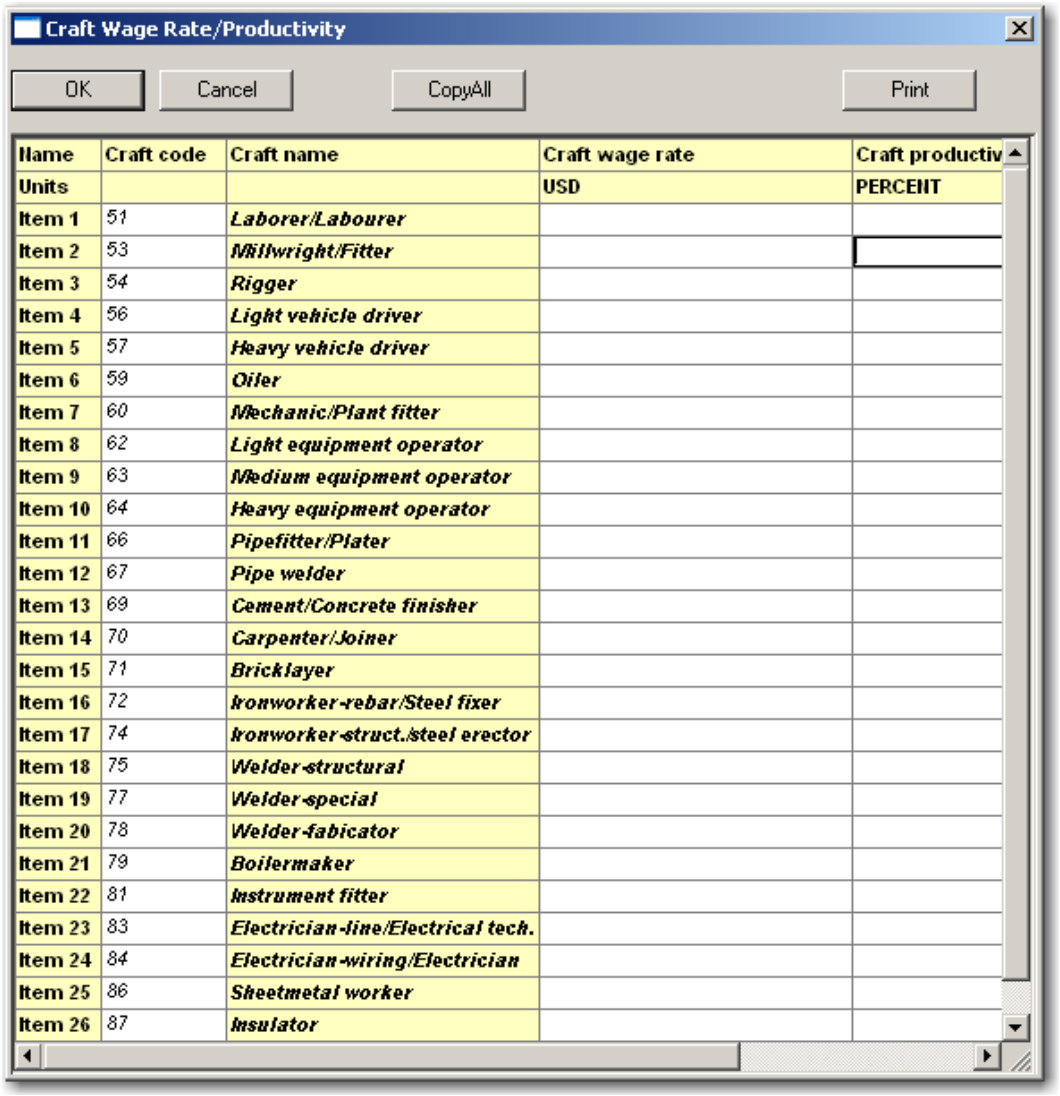
Craft Rates set the wage rate and productivity individually for each craft.

To access Craft Rates:

1. In the **Construction Workforce** subfolder, click **Construction Workforce | Wage Rates**.
2. On the **General Wage Rate/Productivity** dialog box that appears, right-click the red arrow in the **Craft Wage Rates** field, as shown below.



Aspen In-Plant Cost Estimator displays the **Craft Wage Rate/Productivity** dialog box.



Name	Craft code	Craft name	Craft wage rate	Craft productiv
Units			USD	PERCENT
Item 1	51	Laborer/Labourer		
Item 2	53	Millwright/Fitter		
Item 3	54	Rigger		
Item 4	56	Light vehicle driver		
Item 5	57	Heavy vehicle driver		
Item 6	59	Oiler		
Item 7	60	Mechanic/Plant fitter		
Item 8	62	Light equipment operator		
Item 9	63	Medium equipment operator		
Item 10	64	Heavy equipment operator		
Item 11	66	Pipefitter/Plater		
Item 12	67	Pipe welder		
Item 13	69	Cement/Concrete finisher		
Item 14	70	Carpenter/Joiner		
Item 15	71	Bricklayer		
Item 16	72	Ironworker-rebar/Steel fixer		
Item 17	74	Ironworker-struct./steel erector		
Item 18	75	Welder-structural		
Item 19	77	Welder-special		
Item 20	78	Welder-fabicator		
Item 21	79	Boilermaker		
Item 22	81	Instrument fitter		
Item 23	83	Electrician-line/Electrical tech.		
Item 24	84	Electrician-wiring/Electrician		
Item 25	86	Sheetmetal worker		
Item 26	87	Insulator		

Use these fields to set the wage rate and productivity individually for each craft in a workforce.

Field	Description
Craft code	Identifies the craft to which the following wage rate and productivity apply. The craft code must be an existing system craft code.
Craft Wage rate	Specifies the wage rate (in the project currency) for this craft for standard hours.
Productivity	Specifies the productivity of this craft as a percentage of the system's base. (See discussion in *Icarus Reference*.)

To Add a Construction Workforce:

- On the **General Wage Rate/Productivity** dialog box, click **Add**.

A new construction workforce column appears to the right of the current construction workforce.

To Delete a Construction Workforce:

1. On the **General Wage Rate/Productivity** dialog box, highlight one or more columns to delete.
2. Click **Delete.**
3. When prompted as to whether you want to delete the column(s), click **Yes**.

Aspen In-Plant Cost Estimator deletes the column(s) you highlighted.

Note: If you do not highlight a column and perform a delete, the right-most column is deleted.

To Copy Craft Wage Rate/Productivity Information to an Excel Spreadsheet:

1. On the **Craft Wage Rate/Productivity Information** dialog box, click **CopyAll**.
2. Navigate to the Excel spreadsheet to which you want to copy the information.
3. Click CTRL-V.

The information is pasted into the spreadsheet.

How Aspen In-Plant Cost Estimator Calculates the Overtime Premium

The overtime premium formula uses the following variables:

A – Hours, Direct Field Labor

B – Average Craft Rate

C – Overtime Rate (% STD) as set in General Wage Rates

D – Work Week per Shift, Overtime (hours)

E – Work Week per Shift, Standard (hours)

F – Overtime Premium

The overtime premium formula is as follows:

F = A * B * (C – 1) * (D / E + D)

Accessing Manpower Productivity Expert (MPE)

The Mentor Manpower Productivity Expert (MPE) is integrated into Aspen In-Plant Cost Estimator. MPE assists in estimating field manpower productivity

for a construction project as a percent of Icarus' Japanese, UK or US base productivity.

To access MPE:

- On the **Tools** menu, click **Manpower Productivity Expert (MPE)**.

The **MPE** logo window appears.

Note: You must manually transfer MPE results to Aspen In-Plant Cost Estimator.

See the *MPE User's Manual* for instructions on using MPE.

Codes of Accounts

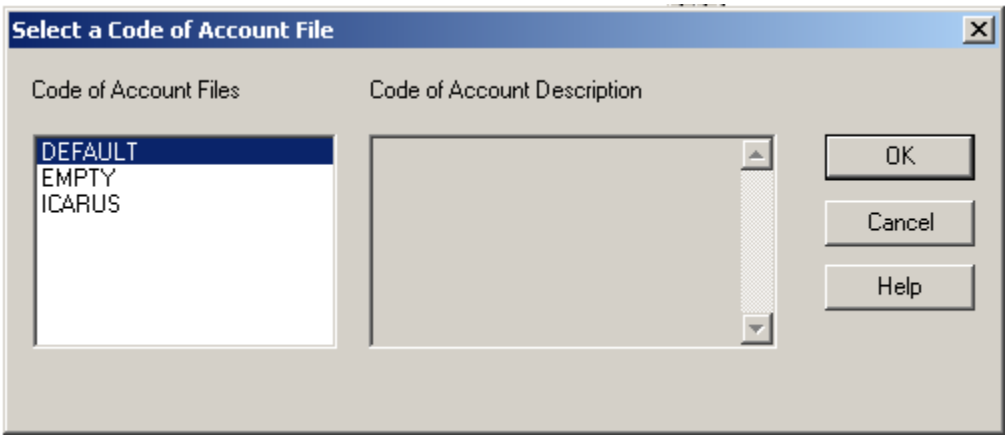
Aspen In-Plant Cost Estimator contains a base set of 3-digit Codes of Accounts (COA) to which costs and man-hours are allocated. See *Icarus Reference*, Chapter 34, for a detailed Icarus COA list. Aspen In-Plant Cost Estimator lets you add your own COA's and re-allocate costs from Icarus COA's to your new COA's. When you completely re-define your COA's, you must also define and allocate all indirect COA's.

First, you must select the COA file.

To select a COA file:

1 Right-click on **Code of Accounts** in the **Basis for Capital Costs** folder, and then click **Select** on the pop-up menu.

Aspen In-Plant Cost Estimator provides the file named DEFAULT. After selecting this file, you can modify it and save it as another file. You can then have multiple COA sets from which to choose.



2 Select the file and click **OK**.

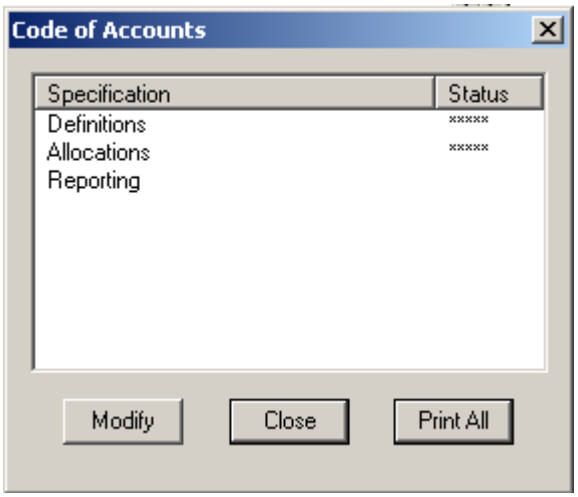
Adding a COA Set and Allocating Costs

The following instructions provide an example COA set for you to add. The instructions will then show you how to allocate material and labor costs to the new COA set.

To add a COA set:

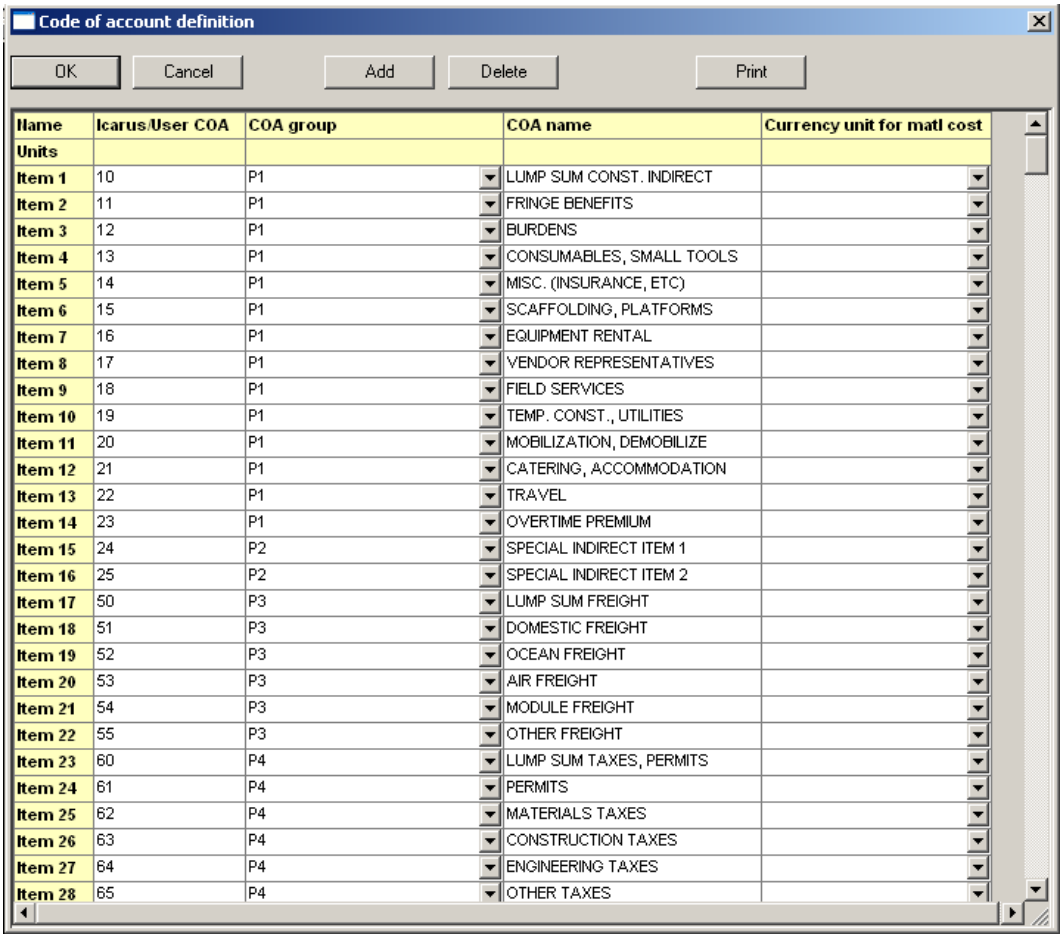
1 Right-click **Code of Accounts** in the **Basis for Capital Costs** folder; then click **Edit** on the pop-up menu.

The **Code of Accounts** dialog box appears.



2 Click **Definitions**; then click **Modify.**

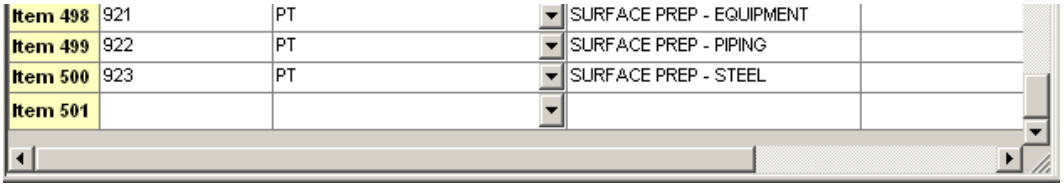
The **Code of account definition** dialog box appears.



Name	Icarus/User COA	COA group	COA name	Currency unit for matl cost
Units				
Item 1	10	P1	LUMP SUM CONST. INDIRECT	
Item 2	11	P1	FRINGE BENEFITS	
Item 3	12	P1	BURDENS	
Item 4	13	P1	CONSUMABLES, SMALL TOOLS	
Item 5	14	P1	MISC. (INSURANCE, ETC)	
Item 6	15	P1	SCAFFOLDING, PLATFORMS	
Item 7	16	P1	EQUIPMENT RENTAL	
Item 8	17	P1	VENDOR REPRESENTATIVES	
Item 9	18	P1	FIELD SERVICES	
Item 10	19	P1	TEMP. CONST., UTILITIES	
Item 11	20	P1	MOBILIZATION, DEMOBILIZE	
Item 12	21	P1	CATERING, ACCOMMODATION	
Item 13	22	P1	TRAVEL	
Item 14	23	P1	OVERTIME PREMIUM	
Item 15	24	P2	SPECIAL INDIRECT ITEM 1	
Item 16	25	P2	SPECIAL INDIRECT ITEM 2	
Item 17	50	P3	LUMP SUM FREIGHT	
Item 18	51	P3	DOMESTIC FREIGHT	
Item 19	52	P3	OCEAN FREIGHT	
Item 20	53	P3	AIR FREIGHT	
Item 21	54	P3	MODULE FREIGHT	
Item 22	55	P3	OTHER FREIGHT	
Item 23	60	P4	LUMP SUM TAXES, PERMITS	
Item 24	61	P4	PERMITS	
Item 25	62	P4	MATERIALS TAXES	
Item 26	63	P4	CONSTRUCTION TAXES	
Item 27	64	P4	ENGINEERING TAXES	
Item 28	65	P4	OTHER TAXES	

3 Click **Add.**

A new item (in this example, Item 501, is added at the bottom of the grid.



Item 498	921	PT	SURFACE PREP - EQUIPMENT	
Item 499	922	PT	SURFACE PREP - PIPING	
Item 500	923	PT	SURFACE PREP - STEEL	
Item 501				

4 For the new item**,** enter an account number, select a COA group, and enter a description (all in upper-case).

5 Repeat this step for each new COA in the set.

Example set:

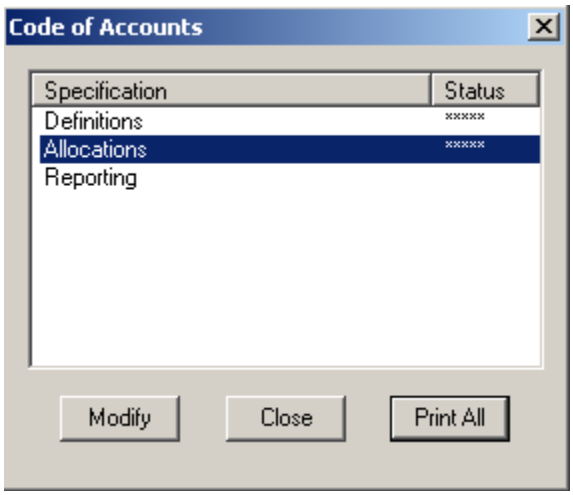
COA	COA Group	Description
1000	EQ	ALL CATEGORY A EQUIPMENT
2000	EQ	ALL CATEGORY B EQUIPMENT
3000	P	ALL PIPING
4000	C	ALL CIVIL
5000	ST	ALL STEEL
6000	I	ALL INSTRUMENTATION

7000	E	ALL ELECTRICAL
8000	IN	ALL INSULATION
9000	PT	ALL PAINT

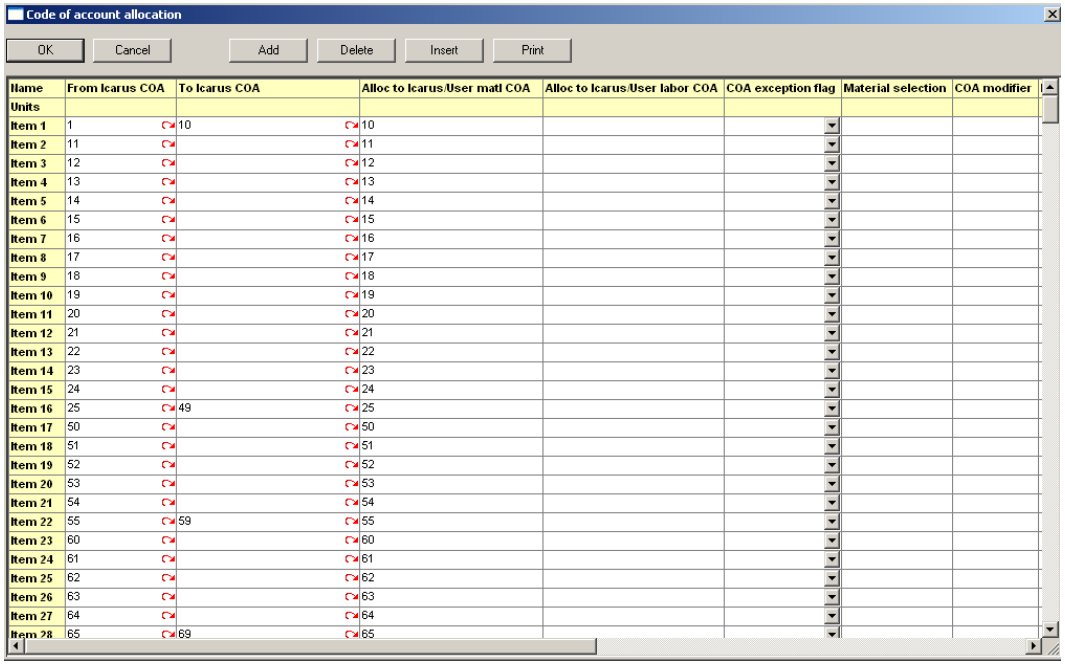
6 When you are finished adding COA's, click **OK**.

To re-allocate costs from Icarus COA's to your new COA's:

1 In the **Code of Accounts** dialog box, double-click **Allocations**.



The **Code of account allocation** dialog box appears.



2 In the **Code of account allocation** dialog box, enter an Icarus COA or range of Icarus COA's (using the **From Icarus COA** and **To Icarus COA** fields) and then enter the new COA to which you want to allocate the Icarus COA's material and labor.

Entering a COA only in the **Alloc to Icarus/ User Matl COA** field allocates both material ***and*** labor to the COA entered in the **Material** field. You could allocate material to one COA and labor to another.

3 Click **OK** when you are finished making the entry, and then continue to allocate each Icarus COA or range of Icarus COA's to one of the new COA's.

Example set:

From	To	Material
100	199	1000
200	299	2000
300	399	3000
400	499	4000
500	599	5000
600	699	6000
700	799	7000
800	899	8000
900	999	9000

Specifying Exceptions to Account Allocations

After you have defined the account allocations, you may choose to specify exceptions to these new allocations.

Example: We have allocated the costs of all piping — Icarus COA's 300-399 — to COA 3000. However, we wish to allocate the material costs of 6-8 INCH 304P Pipe to a new account, COA 3201, and we wish to allocate the labor costs of 6-8 INCH 304P Pipe to another new account, COA 3202.

To specify the exceptions in the above example:

1 First, create COA 3201, type P, with the description MATL SS PIPE 6-18 INCH and create COA 3202, type P, with the description MATL SS PIPE 6-18 INCH.

2 Identify in *Icarus Reference*, Chapter 34, "Code of Accounts," which range of Icarus COA's to allocate to 3201 and 3202. In this case, it is COA's 320 to 327, representing stainless steel pipe.

3 Click in a cell above which you want to add the new item, then click **Insert.**

4 Enter "320" in the **From Icarus COA** field and "327" in the **To Icarus COA** field. Enter "3201" in the **Alloc to Icarus/ User matl COA** field and enter "3202" in the **Alloc to Icarus/ User labor COA** field.

5 In the **COA exception flag** field, from the drop-down select **E (Allow account exception)**

6 In the **Material selection** field, enter "304P" as the Material.

Note: *Icarus Reference*, Chapter 28, "Material Selections," provides the symbols for stainless steel and other materials. Many stainless steels are available. This example is limited to 304P for brevity.

7 In the **Pipe diameter – lower limit** field, enter "6." In the **Pipe diameter – upper limit** field, enter "18."

8 Make sure that **I (Inch-Pound)** is selected in the **Pipe dia. units of measure** field.

Note: COA Modifier and Subtype let you be more specific about the items you want allocated to a new COA. They are described in Icarus Reference, Chapter 35, "Database Relations".

9 Click **OK**. This moves all material costs for all 6-18 INCH 304P pipe, fittings, and valves to COA 3201 and all labor costs for these items to COA 3202.

10 When you are finished, review the Account Allocation order to see that the accounts are in the correct order. Then click **OK** to save your work and exit the **COA code of account allocation** dialog box.

Overriding Code of Accounts at the Component Level

You can override a Code of Account for a specific component.

To Override a Code of Account for a specific component:

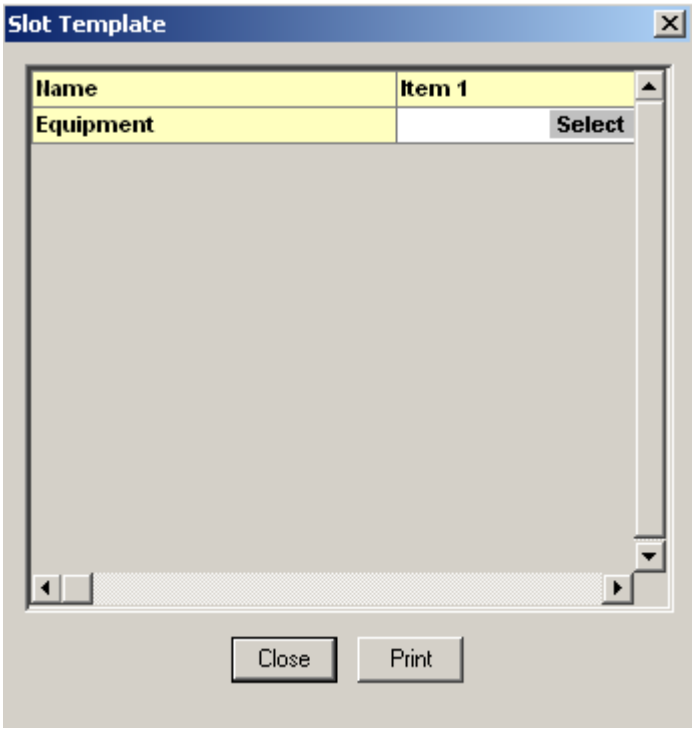
1 In a project, on the **Project View** tab, right-click the component whose Code of Account you want to change.

2 On the menu that appears, click **Modify Item**.

The **Equipment Spec** sheet appears.

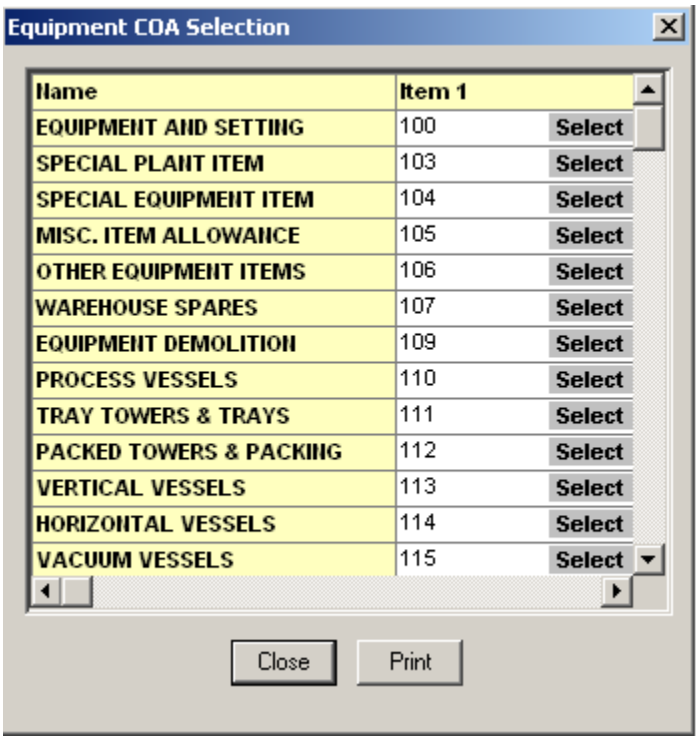
3 On the **Equipment Spec** sheet, left-click the red arrow in the **Code of account** field.

The **Slot Template** dialog box appears.



4 On the **Slot Template** dialog box, click **Select**.

The **Equipment COA Selection** dialog box appears.



5 On the **Equipment COA Selection** dialog box, scroll to the Equipment and COA you want to assign to your equipment; then click **Select**.

The **Equipment Spec** sheet reappears with the COA you selected in the **Code of Account** field.

Choosing between the Icarus Code of Accounts and User Code of Accounts at the Component Level

To specify whether an equipment unit should use the Icarus Code of Accounts or the User Code of Accounts:

1. In a project, on the **Project View** tab, right-click the component whose Code of Account you want to change.
2. On the menu that appears, click **Modify Item**.

The **Equipment Spec** sheet appears.

3. On the **Equipment Spec** sheet, in the **Icarus/User COA Option** field, click the drop-down arrow.
4. Click the appropriate COA option.

Indexing

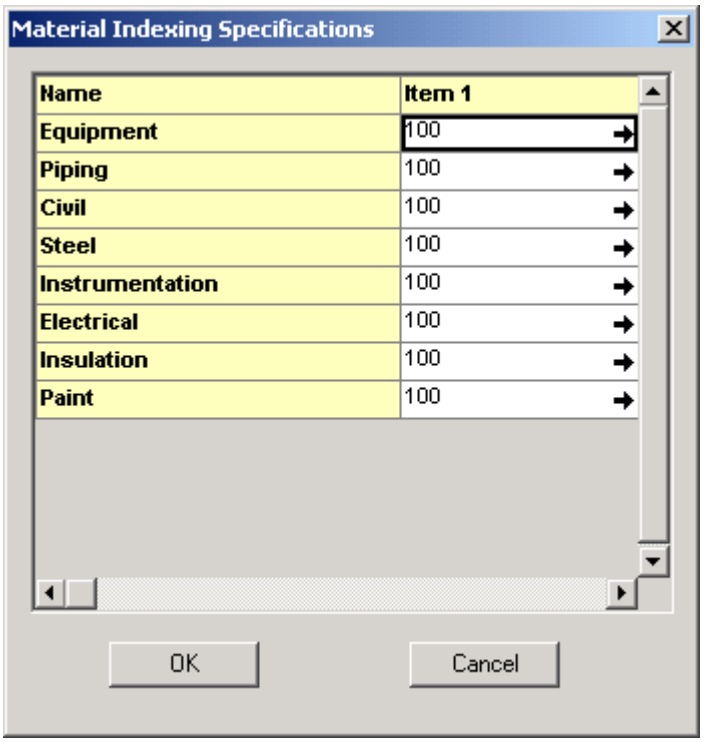
The Material and Man-hour specification forms in the Indexing folder allow you to manipulate the material and/or man-hour costs for process equipment and installation bulks. You can also adjust these indexes by location by using the Location specification form.

For example, you could specify to increase the material costs associated with a type of process equipment.

Indexing is used to tailor Aspen In-Plant Cost Estimator to mimic your work methods and costs. If your equipment costs for a category are consistently offset from Aspen In-Plant Cost Estimator's values, use Indexing to correct that.

To adjust the Material or Man-hour index:

1. Right-click on **Material** or **Man-hour** and click **Edit**.



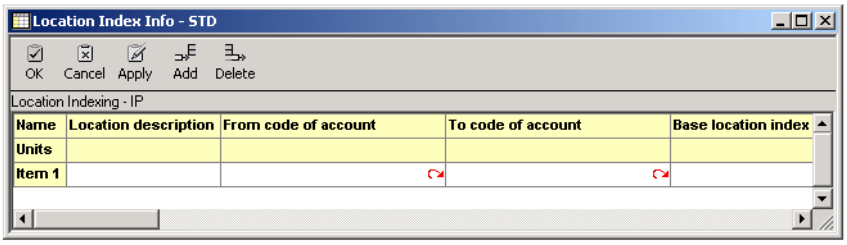
2 To adjust the index for all equipment or for all of one of the installation bulks, enter the index value in the box provided. For example, entering "200" in the Equipment box will double the material costs for all items under the equipment account group.

To adjust the index for a sub-category, click the arrow-button in the box. This accesses a similar form listing sub-categories corresponding to the Code of Accounts (see Icarus Reference, Chapter 34, for a complete list). Adjustments to a sub-category override adjustments to the account-group.

3 Click **OK** to close the form and apply changes.

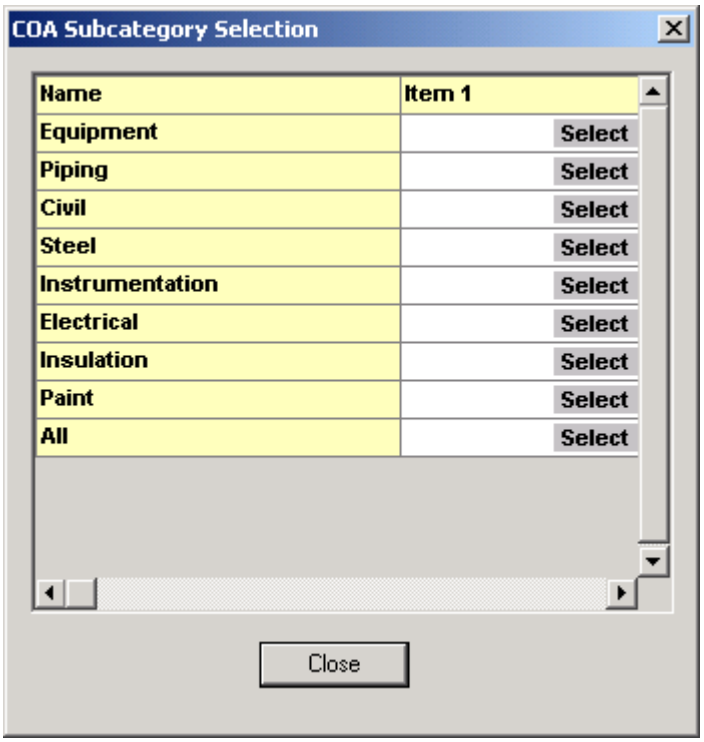
To adjust by location:

1 Right-click on Location and click Edit.

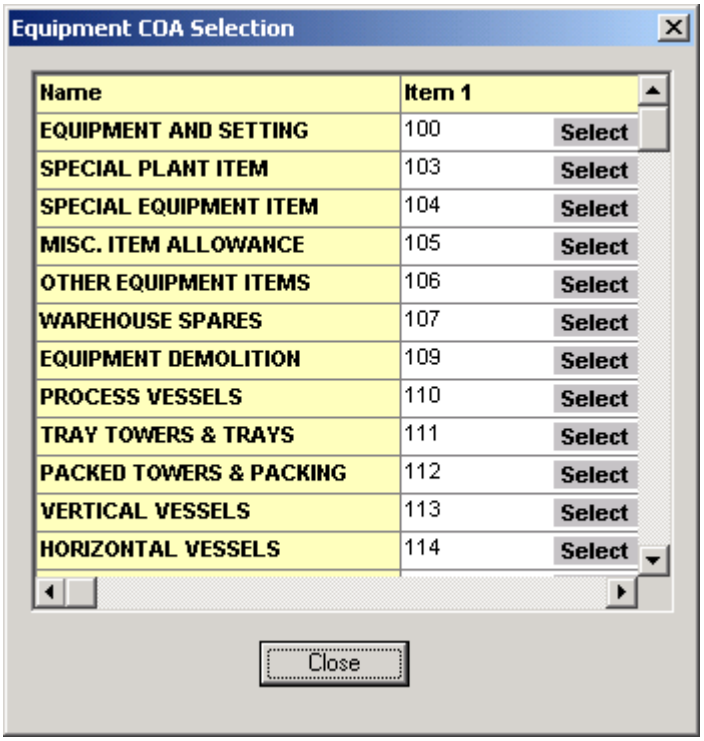


2 Type the location description.

3 Type the Code of Account (COA) to indicate the start of the COA range, or click the red arrow and then click Select by the subcategory on the COA Subcategory Selection window.



The **Equipment COA Selection** dialog box appears.



4 Click **Select** again by the COA.

The COA is entered on the form.

5 Do the same to indicate the end of the COA range.

6 Enter the amount to escalate material costs and/or the amount to escalate man-hour costs.

7 To escalate another range, click **Add**.

8 Click **OK** to close the form and apply changes.

Equipment Rental

Aspen In-Plant Cost Estimator automatically develops rental equipment durations and costs based on your project work items. You may adjust or delete these items and/or add your own to more accurately reflect the project.

Adjusting and Deleting System Items

To adjust or delete system equipment rental items:

1 In the Basis for Capital Costs folder, right-click on **Equipment Rental**, then, on the menu that appears, click **Edit** on the pop-up menu.

Aspen In-Plant Cost Estimator displays the Equipment Rental Info specifications form in the Main Window. A column for the first rental item, labeled Item 1, is provided. If you need to add a column, click **Add**.

2 Enter an item description and rental equipment number. See *Icarus Reference*, Chapter 32, for a complete list of construction equipment and associated equipment numbers.

3 Click a **Rental Action** Code.

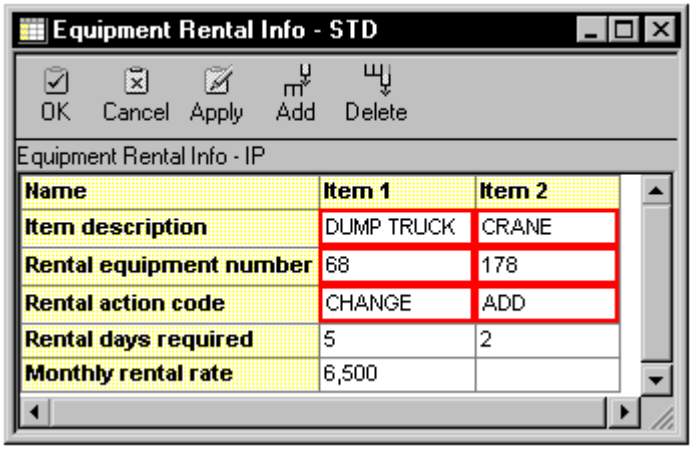
Click	to
ADD	Add days to the rental item's **Rental Days Required**. **Note:** You cannot use this option to adjust **Monthly Rental Rate**.
CHANGE	Replace the rental item's **Rental Days Required** and/or the **Monthly Rental Rate**.
DELETE	Delete the rental item.

Note: To change an existing item's rental rate, you must click **CHANGE**.

9 In the **Rental Days Required** field, depending on the action code, either enter the number of days to add (action code is ADD) or the total number of days (action code is CHANGE).

5 If you've selected the CHANGE action code, you can enter a new rate in the **Monthly Rate** field or leave it blank to use the system's default rate.

You cannot adjust an existing item's monthly rate using the ADD action code.



Here, The number of days required for Item 1, **DUMP TRUCK**, is being changed to 5, and its monthly rate is being changed to $6,500. Two days are being added to the days required for Item 2, **CRANE**.

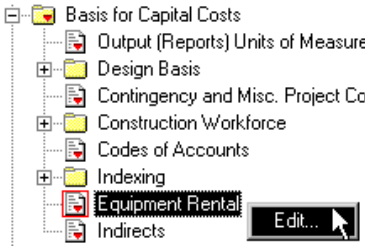
6 Click **OK** to save the specifications and close the specifications form.

Entering New Rental Items

Aspen In-Plant Cost Estimator provides empty slots in every equipment class for user-entered equipment items. Any that you enter are added to those that Aspen In-Plant Cost Estimator develops based on your project work items.

To enter a new rental item:

1 In the Basis for Capital Costs folder, right-click on Equipment Rental and then click Edit on the pop-up menu.



Aspen In-Plant Cost Estimator displays the equipment rental specifications form in the Main Window. A column for the first rental item, labeled Item 1, is provided. If you need to add a column, click Add.

2 Enter an item description. The first 20 characters will appear in the Description column on the Equipment Rental Summary report. The next 16 characters will appear in the size column on the Equipment Rental Summary report.

3 Enter an equipment number. Numbers 1-20 are for the equipment class AUTOMOTIVE. All other numbers will share the equipment class of the equipment number before it. For example, an item assigned equipment number 79 would be classified EARTHMOVING because that is the equipment class of equipment number 78. Each equipment class includes unused numbers for user-entries. Refer to *Icarus Reference*, Chapter 32,

for a complete list of construction equipment and associated equipment numbers.

4 Click **Add** as the Rental Action Code.

5 Enter the Rental Days Required.

6 Enter the Monthly Rate.

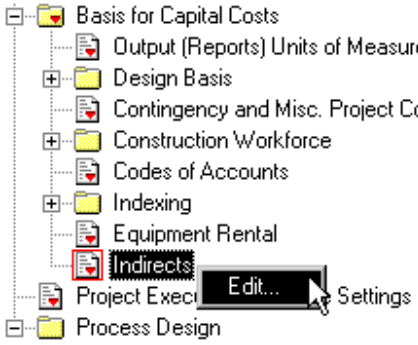
7 Click **OK** to save the specifications and close the specifications form.

Indirects

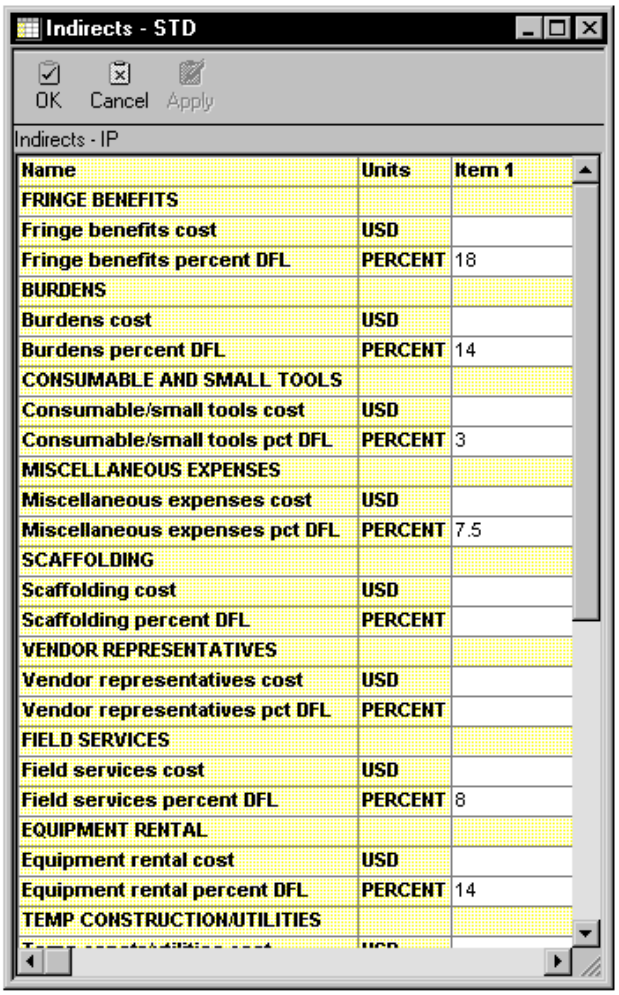
Indirect costs appear only in the Project Summary report.

To define indirects:

1 In the Basis for Capital Costs folder, right-click on Indirects and then click Edit on the pop-up menu.



Aspen In-Plant Cost Estimator displays the Indirects specifications form in the Main Window.



Name	Units	Item 1
FRINGE BENEFITS		
Fringe benefits cost	USD	
Fringe benefits percent DFL	PERCENT	18
BURDENS		
Burdens cost	USD	
Burdens percent DFL	PERCENT	14
CONSUMABLE AND SMALL TOOLS		
Consumable/small tools cost	USD	
Consumable/small tools pct DFL	PERCENT	3
MISCELLANEOUS EXPENSES		
Miscellaneous expenses cost	USD	
Miscellaneous expenses pct DFL	PERCENT	7.5
SCAFFOLDING		
Scaffolding cost	USD	
Scaffolding percent DFL	PERCENT	
VENDOR REPRESENTATIVES		
Vendor representatives cost	USD	
Vendor representatives pct DFL	PERCENT	
FIELD SERVICES		
Field services cost	USD	
Field services percent DFL	PERCENT	8
EQUIPMENT RENTAL		
Equipment rental cost	USD	
Equipment rental percent DFL	PERCENT	14
TEMP CONSTRUCTION/UTILITIES		

2 For each indirect, enter either a percentage or a lump sum (not both). Indirect costs not entered default to 0.

Indirects	For
Fringe Benefits	Employer contributions for vacation, holidays, sick leave, retirement, and so on
Burdens	*For US Base only* — Mandatory contributions for Federal Social Security (FICA), Federal Unemployment Insurance (FUI), Workmen's Compensation and State Unemployment Insurance.
	For UK Base only — Mandatory National Insurance contributions.
Consumables	The cost of small tools, consumable material other than welding supplies.
Scaffolding	All scaffolding except that required by vendors.
Vendor Representatives	Travel, sustenances and average rates for vendor field representative, (for example, a compressor specialist.)
Field Services	Medical, first aid, transport, welder tests and welding supplies.

Indirects	For
Equipment Rental	Costs of renting construction equipment.
Temporary Construction	Temporary shelter and sanitary facilities, utilities, temporary power, roadways, rigging and fencing.
Mobilization / Demobilization	The transportation cost of equipment, offices, and so on to and from the construction site.
Catering and Accommodations	Costs of providing food and accommodations.
Travel	Travel costs.
Special Indirect Items	Two special indirect items to account for other indirect costs, such as job cleanup costs, watchmen, equipment servicing, public liability, damage, automobile and all-risk insurance, and warehousing.

3 Click **OK** to apply the specifications and close the form.

Importing old Standard basis files

1 Open your Aspen In-Plant Cost Estimator Software.

2 Go to the **Libraries** tab.

3 Click **Basis for Capital Costs**.

4 Right-click either **Inch-Pound** or **Metric**.

5 Click **IMPORT**.

The dialog that appears defaults to looking for the Aspen In-Plant Cost Estimator file.

6 Browse to the Aspen In-Plant Cost Estimator file you want to import.

7 Click the Aspen In-Plant Cost Estimator file to import.

Your Aspen In-Plant Cost Estimator template (standard basis file) is now in the new Aspen In-Plant Cost Estimator system.

Customer External Files

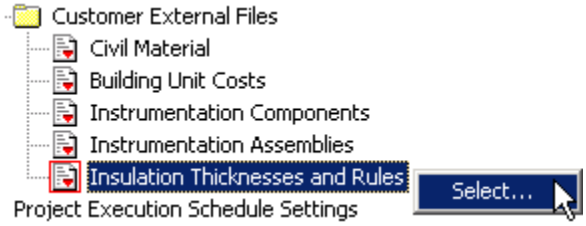
When certain specifications, such as pipe insulation thickness, are not entered by the user, Aspen In-Plant Cost Estimator refers to ASCII format files to make the appropriate selection. These files are accessible in the Palette's Libraries view. There, in the Customer External Files folder, these files are divided into subfolders that correspond to the categories in Project Explorer's Customer External Files folder. When no project is open, you can create in the Palette a duplicate of a default or template file, assigning it a different name (see page 115 for instructions). You can then open the file (stored at AspenTech/Aspen Icarus *2004.1*/Data, unless location is changed in

Preferences) in any ASCII text editor and customize the rules and specifications. (Refer to *Icarus Reference* when customizing files. Chapter 23 of *Icarus Reference* provides instructions on how to customize an insulation specs file.)

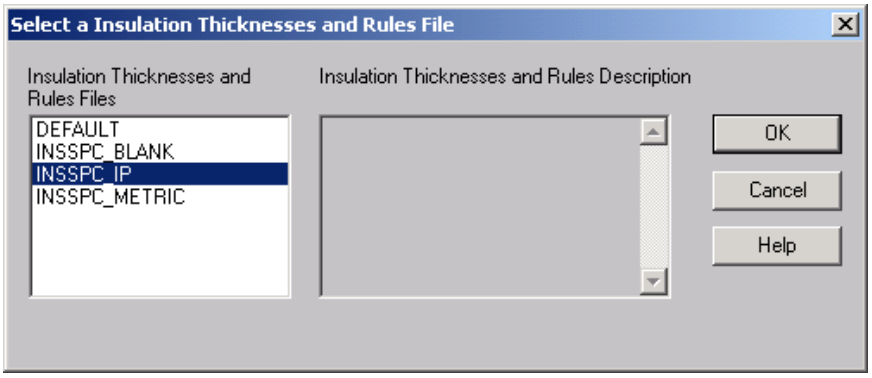
To use a customer external file, you will need to select it in Project Explorer. Otherwise, Aspen In-Plant Cost Estimator uses the default file.

To select a file:

1 Right-click on the category and click **Select** on the pop-up menu.



A selection dialog box appears.



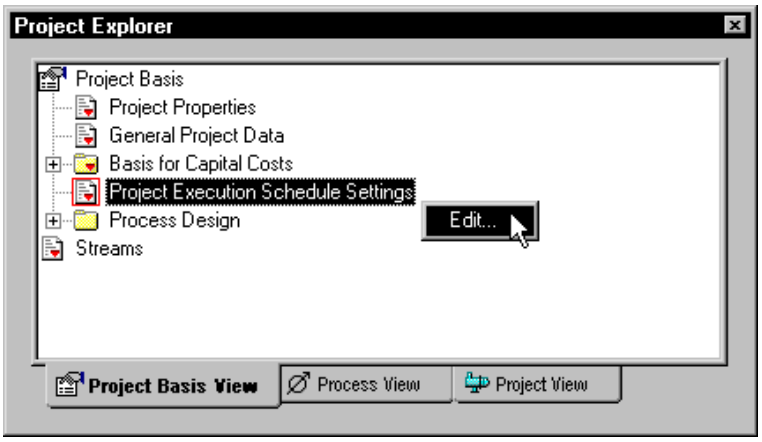
2 Select the file you want to use and click **OK**.

Project Execution Schedule Settings

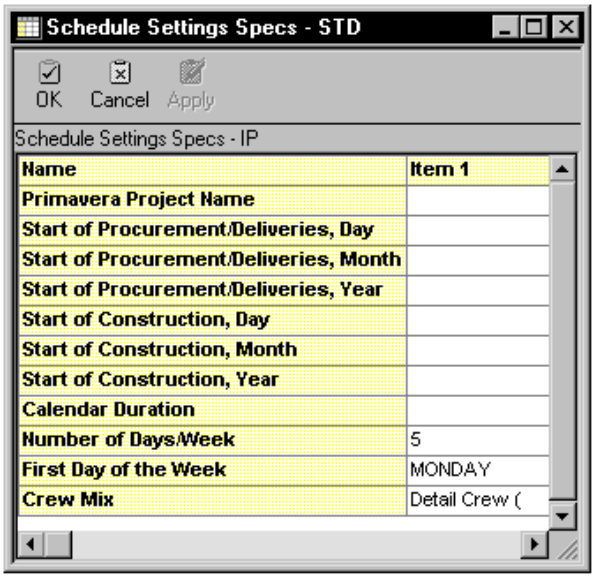
Project Execution Schedule Settings prepare the basic organization of the preliminary schedule that Aspen In-Plant Cost Estimator can generate for use in your scheduling program. For more information on preparing the preliminary schedule, see Chapter 8, "Developing a Schedule."

To enter Project Execution Schedule Settings:

1 In Project Explorer's **Project Basis** view, right-click **Project Execution Schedule Settings** and then click **Edit**.



Aspen In-Plant Cost Estimator displays a specifications form for Schedule Settings in the Main Window.



2 If you are using Primavera as your scheduling program, enter the 4-character filename that Aspen In-Plant Cost Estimator will generate when you develop schedules and cost reports. The default filename is DFLT.

3 Define the procurement and deliveries start date, including month, day and year. If the schedule is to include cost tracking, the date defaults to three months prior to the current date. If the schedule does not include cost tracking, the current date is used as the default.

Month: The month in which procurement/deliveries will start. Select a month from the drop-down menu.

Day: The day of the month on which procurement/deliveries will start. Select a value 1 - 31, corresponding to the days of the month.

Year: The last two digits of the year in which procurement/deliveries will start.

4 Enter the construction start date, including the month, day and year. The current date is used as the default.

Month: The month in which construction will start. Select a month from the drop-down menu.

Day: The day of the month on which construction will start. Select a value 1 - 31.

Year: The last two digits of the year in which construction will start.

5 In the **Calendar Duration** field, enter the duration of the project in years (1-20).

Note: This field is not in use.

6 Define the work week:

Select the number of days in the work week.

Select the first working day of the week.

7 Define the crew mix by choosing one of the following options:

Option	To do this
Detail Crew (All Crafts)	Use all 29 crafts in the schedule.
General Crew (Acct. Level)	Summarize the crew mix by account level (equipment setting, piping, civil, steel, instrumentation, electrical, insulation and paint.)

8 Click **OK** to save the specifications and close the form.

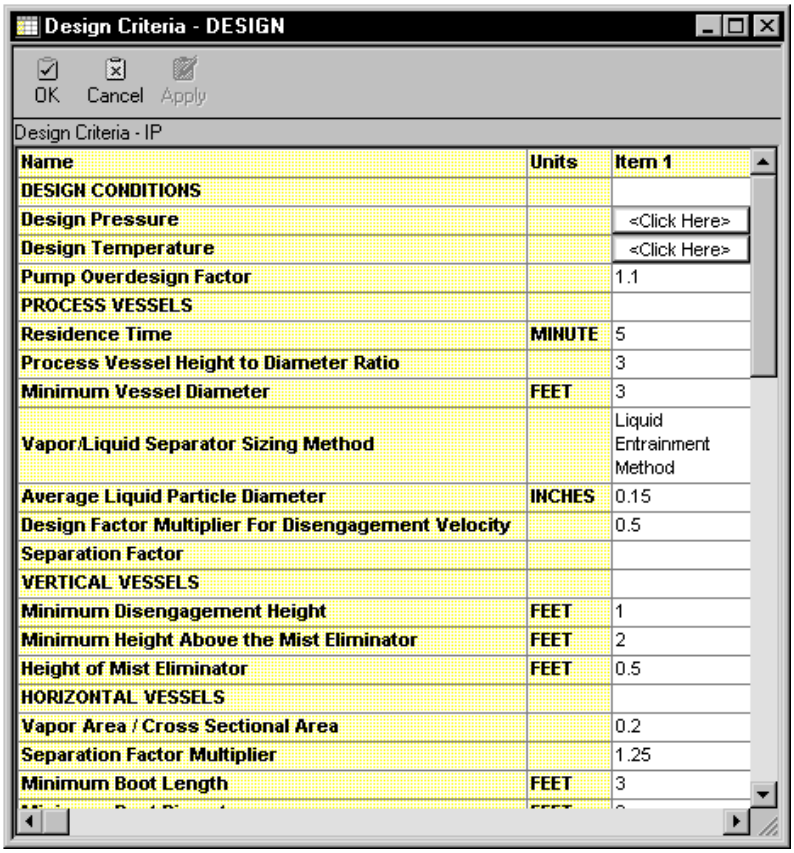
Process Design

Design Criteria

Aspen In-Plant Cost Estimator's Sizing Expert for heat exchangers uses design values based on specifications in the Design Conditions and Heat Exchangers sections of the Design Criteria specifications form. You may disregard the form's other sections, which are only used by other Icarus products.

To access Design Criteria specifications, right-click Design Criteria in the Project Basis view's Process Design folder, and then click Edit.

Aspen In-Plant Cost Estimator displays the specifications form in the Main Window.

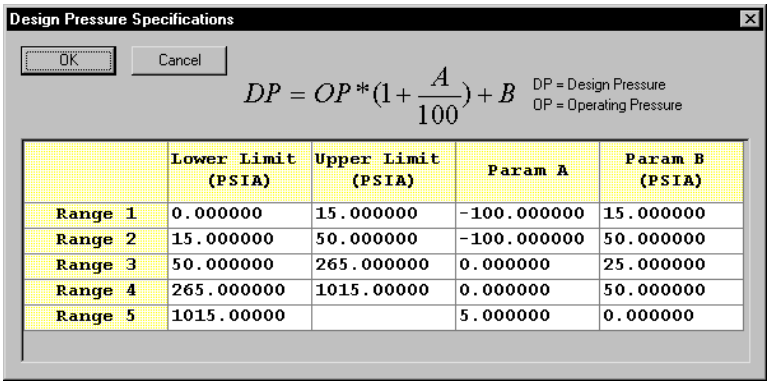


Name	Units	Item 1
DESIGN CONDITIONS		
Design Pressure		<Click Here>
Design Temperature		<Click Here>
Pump Overdesign Factor		1.1
PROCESS VESSELS		
Residence Time	MINUTE	5
Process Vessel Height to Diameter Ratio		3
Minimum Vessel Diameter	FEET	3
Vapor/Liquid Separator Sizing Method		Liquid Entrainment Method
Average Liquid Particle Diameter	INCHES	0.15
Design Factor Multiplier For Disengagement Velocity		0.5
Separation Factor		
VERTICAL VESSELS		
Minimum Disengagement Height	FEET	1
Minimum Height Above the Mist Eliminator	FEET	2
Height of Mist Eliminator	FEET	0.5
HORIZONTAL VESSELS		
Vapor Area / Cross Sectional Area		0.2
Separation Factor Multiplier		1.25
Minimum Boot Length	FEET	3

The **Design Pressure** and **Design Temperature** fields in the **Design Conditions** section are used by the Sizing Expert.

Design Pressure

Click the **Design Pressure** field to open the Design Pressure Specifications form. The specifications form lets you specify rules for calculating the design pressure based on the range in which the operating pressure falls. The design pressure is calculated from the operating pressure using the formula shown on the form. You can modify the pressure limit (upper and lower limit) as well as parameters A and B.

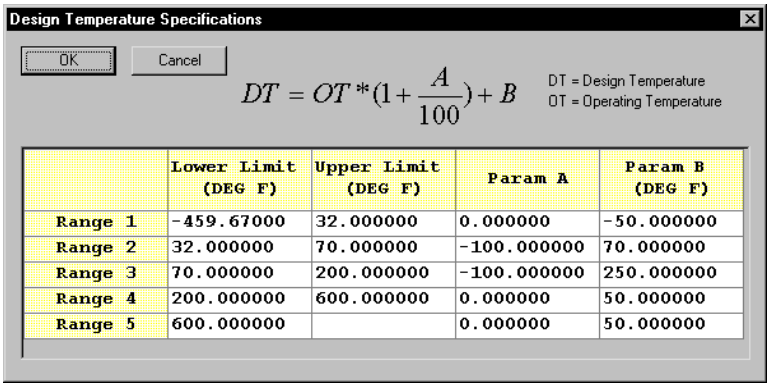


	Lower Limit (PSIA)	Upper Limit (PSIA)	Param A	Param B (PSIA)
Range 1	0.000000	15.000000	-100.000000	15.000000
Range 2	15.000000	50.000000	-100.000000	50.000000
Range 3	50.000000	265.000000	0.000000	25.000000
Range 4	265.000000	1015.00000	0.000000	50.000000
Range 5	1015.00000		5.000000	0.000000

Design Temperature

Click the **Design Temperature** field to open the **Design Temperature Specifications** form. The specifications form lets you specify rules for

calculating the design temperature based on the range in which the operating temperature falls. The design pressure is calculated from the operating temperature using the formula shown on the form. You can modify the temperature ranges (upper and lower limit) as well as parameters A and B.



	Lower Limit (DEG F)	Upper Limit (DEG F)	Param A	Param B (DEG F)
Range 1	-459.67000	32.000000	0.000000	-50.000000
Range 2	32.000000	70.000000	-100.000000	70.000000
Range 3	70.000000	200.000000	-100.000000	250.000000
Range 4	200.000000	600.000000	0.000000	50.000000
Range 5	600.000000		0.000000	50.000000

The Heat Exchanger section begins on the twenty-eighth row and includes the following fields:

Heat Exchanger Area Minimum Overdesign Factor

The calculated heat transfer area is multiplied by the value specified. The mechanical design is performed for the final heat transfer area. For example:

Calculated surface area = 1,000 SF,

Heat Exchanger Area Minimum Overdesign Factor = 1.1

Surface area used for mechanical design: 1,000 X 1.1 = 1,100 SF

Note that the final surface area in general is greater than the calculated value because of mechanical considerations.

Apply 2/3 Rule for Design Pressure

In the design of shell and tube heat exchangers, design engineers sometimes apply the 2/3rd rule in calculating the design pressure. As per ASME heat exchanger code, if the design pressure of the lower-pressure side (either tube or shell) is at least 2/3rd the design pressure on the high-pressure side, then overpressure in the high-pressure side will not result in rupture in the lower-pressure side (provided relief devices have been properly sized).

When specified, the 2/3 rule will increase the design pressure of the low pressure side to at least 67% of the design pressure of the high pressure side, even when the operating pressure on the low pressure side could result in a lower design pressure as per the Design Pressure field.

Air Cooler Inlet Temperature

This field represents the default value that shall be used as the inlet air temperature in the case of Air Coolers.

Air Cooler Exit Temperature

Air Cooler Exit Temperature is used when estimating the surface area of air-cooled heat exchangers. The value specified is used as the exit temperature for the air cooler.

If the field is empty or has value of 0.0, then the sizing expert assigns the exit air temperature value to be 10.0 DEG F greater than the inlet air temperature.

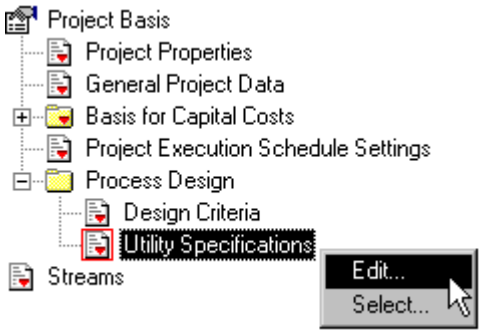
For example, if the Air Cooler Inlet Temperature is 77 DEG F, and the value for Air Cooler Exit Temperature is not provided by the user, then the default value used by Aspen In-Plant Cost Estimator is 87.0 DEG F.

Utility Specifications

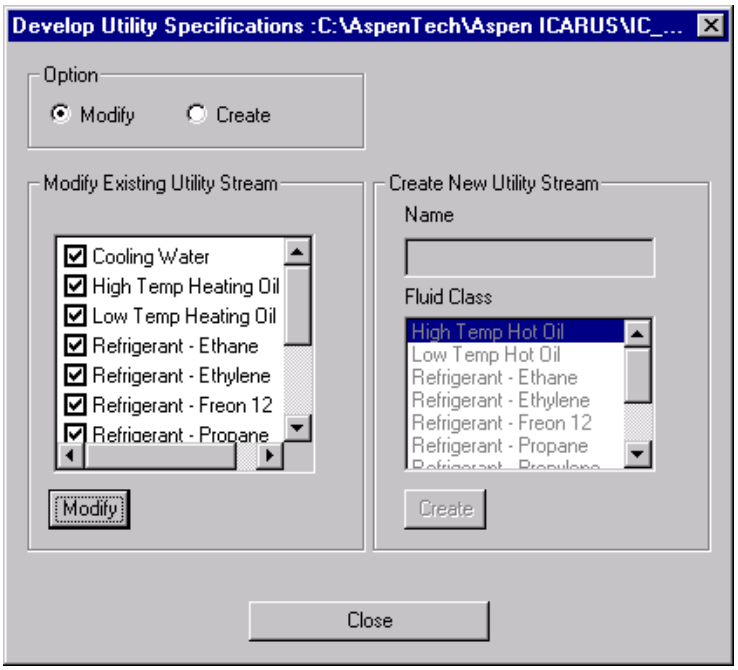
When sizing Heat Exchangers using the Heat Exchanger Sizing Expert (see page 197), you need to select an inlet and an outlet stream. The Sizing Expert provides 11 utility resources that can be selected as streams. Once you select the utility resource for the heat exchanger, then the Sizing Expert creates an actual utility process stream.

To modify or create a utility stream:

1 Right-click on Utility Specifications in the Project Basis view's Process Design folder, and then click Edit on the pop-up menu.



The **Develop Utility Specifications** dialog box appears.

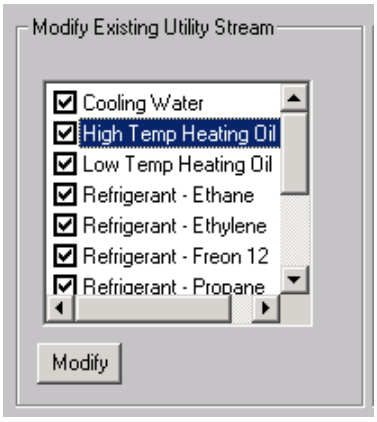


You can either select to modify an existing stream or create a new stream.

Selecting an Existing Utility Stream

2 For you to modify or simply view an existing utility stream, the **Modify** option button must be marked in the **Option** section (it is selected by default).

3 Highlight the stream on the **Modify Existing Utility Stream** list.

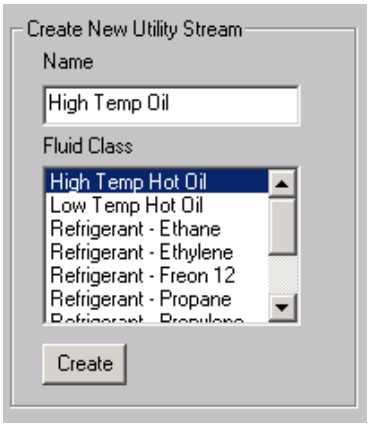


4 Click Modify.

Creating a New Utility Stream

5 To create a new utility stream, click Create in the Option section.

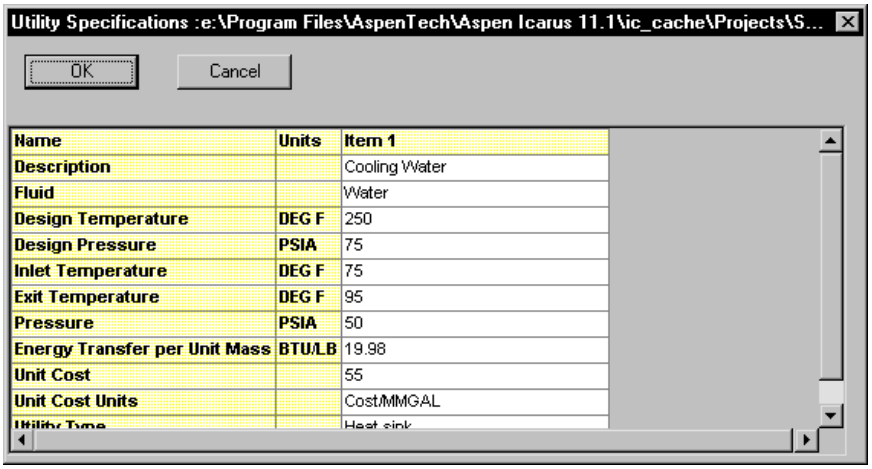
6 Then, in the Create New Utility Stream section, type the name of the new stream and select a fluid class.



Note: In the **Fluid Class** list, **High Temp** refers to heating oil with the properties of DOWTHERM A. **Low Temp** refers to heating oil with the properties of DOWTHERM E.

7 Click **Create**.

8 Enter or modify the specifications on the **Utility Specifications** form.



The form contains the following fields:

- **Description:**

  Describes the utility fluid resource in the sizing report generated by Aspen In-Plant Cost Estimator.

- **Fluid:**

  Determines the type of utility fluid described by the current specification. The fluid class is used to determine the heat transfer coefficient, fouling tendency and related thermal and transport properties used by sizing expert.

- Design Temperature:

  Specifies the temperature, which will be considered in the estimation of the design temperature for the process equipment carrying the utility fluid.

- **Design Pressure**:

  Specifies the pressure, which will be considered in the estimation of the design temperature for the process equipment carrying the utility fluid.

- **Inlet Temperature:**

  Provides the inlet temperature for the utility fluid.

- **Exit Temperature:**

  Provides the exit temperature condition for the utility fluid.

- **Pressure:**

  Provides the operating pressure for the utility fluid.

- **Energy Transfer per Unit Mass**:

  Specifies the amount of energy provided or removed by the utility fluid over the specified temperature range. The value in this field is used to estimate the amount of utility required for the given process conditions.

- **Unit Cost:**

  Provides the cost value used to estimate the utility cost for the project.

- **Unit Cost Units:**

Provides the units for the value provided in the Unit Cost field.

When you specify a new utility fluid resource, all the information on the specifications form must be provided; otherwise, the Heat Exchanger Sizing Expert will not be able to use the utility fluid resource properly.

Using the utility specifications form, you can specify a maximum of 20 utility fluids.

- **Utility Type:**

  Describes the usage of the utility fluid. Select either Heat source or Heat sink.

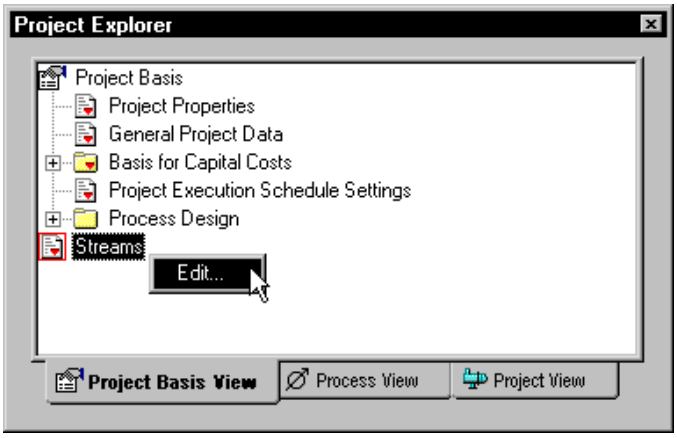
9 Click **OK** when you are done entering or modifying the utility specifications.

Developing Streams

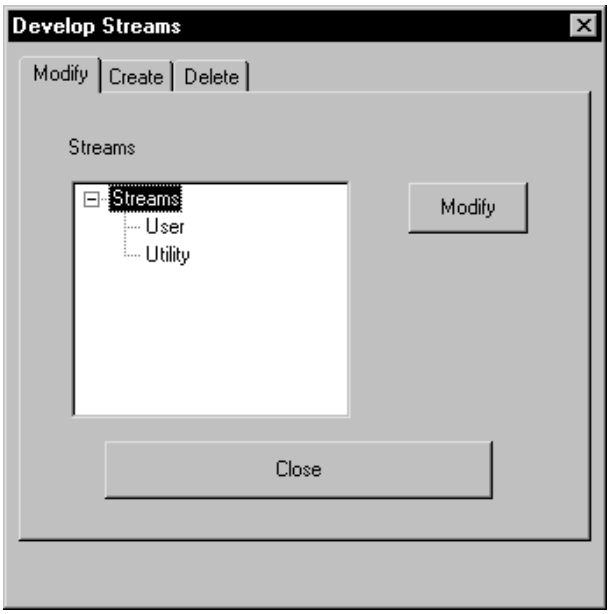
After opening a project, new streams can be developed. You have the option to develop completely new streams or use an existing stream as a base. When an existing stream is used as a base, the new stream can be either copied from the existing stream (Absolute Basis mode) or copied from and linked dynamically to the existing stream (Relative Basis mode).

To develop streams:

- Right-click on Streams in the Project Basis view's main folder (at the bottom), and then click Edit on the pop-up menu.

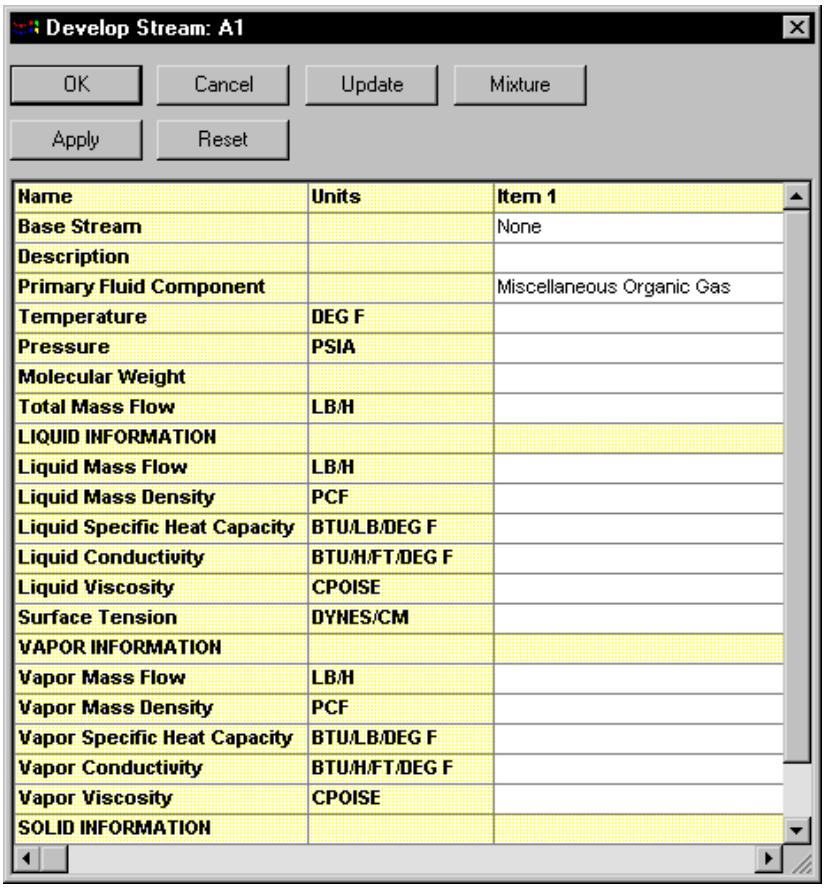


The **Develop Streams** dialog box appears.



Viewing or Modifying an Existing Stream

To view or modify an existing stream, select the stream on the Modify tab view. You may need to use the scrollbar(s) to locate a stream if a large number of streams exist in the project. With the desired stream highlighted, click Modify to have the stream information displayed in a specifications form.



The functions of the six buttons on the Develop Stream specifications form are explained below:

Click	To do this:
OK	• Perform a check on the information currently present in the Develop Stream specifications form to ensure that all information needed to specify the stream is completed. Aspen In-Plant Cost Estimator generates error messages indicating missing data. • Generate estimates for any specifications not entered. • Save the information in the Develop Stream specifications form. The Develop Stream specifications form closes and the Develop Streams dialog box re-appears.
Apply	Same as clicking OK, but does not exit the Develop Stream specifications form. This lets you review the estimates and revise the data.
Update	Same as clicking Apply, except that if the Primary Fluid Component, the Temperature, and/or the Pressure were changed, then all the physical properties of the stream will be estimated using these new values.
Cancel	Exit the Develop Stream specifications form without making checks and does not save or change any information in the database.
Reset	Reset the information in the Develop Stream specifications form to the values previously saved into the database. Any changes have been made since opening the form will be lost.
Mixture	Define a stream as a mixture. Opens the Mixture Specs dialog box

Click	To do this:
	discussed on page .

Most Develop Stream specifications need no further explanation. Those that do are described below.

Primary Fluid Component

One of the most important specifications in this form is Primary Fluid Component, which classifies the chemical components of a stream. The fluid selected here is used as the basis for any properties that are unavailable and need to be estimated to complete the specifications for the stream. The available general fluid classifications are:

- Alcohol
- Aromatic Liquid
- Halogenated Gas
- Heavy Hydrocarbon Liquid
- Hydrocarbon Gas
- Inorganic Gas
- Light Hydrocarbon Liquid
- Medium Hydrocarbon Liquid
- Miscellaneous Inorganic Liquid
- Miscellaneous Organic Gas
- Organic Acid
- Very Heavy Hydrocarbon Liquid
- Solid

The following pure components are also available for selection as the Primary Fluid Component of a stream:

- Acetic Acid
- Ammonia
- Argon
- Carbon Monoxide
- Carbon Dioxide
- Ethane
- Ethanol
- Ethyl Benzene
- Ethylene
- Glycerol
- Hydrogen
- Isopropyl Alcohol
- Methane
- Methanol
- N-Butanol
- Nitric Acid
- Nitrogen
- Oxygen
- Phosphoric Acid
- Propane
- Propanol
- Propylene
- Steam
- Sulfuric Acid
- Toluene
- Water

If the Primary Fluid Component is specified, the other needed information will be filled in with default values. This feature is only apparent when no temperature or pressure is entered into the Develop Stream specifications form and the Primary Fluid Component is changed. After changing the Primary Fluid Component, either press Enter or click on another field and the default values will be loaded. If either the pressure or temperature value is changed from the default value, clicking OK , Apply, or Update will estimate the properties at the new condition(s).

Base Stream

The **Base Stream** field contains the name of the stream on which the displayed stream was based. This cannot be changed.

If the name begins with the character "$", the stream was created using Absolute Basis and the stream name following this character is that of the parent stream. A stream created using Absolute Basis uses the data from the parent stream; however, if the parent steam's data changes afterward, the Absolute Basis stream is not updated.

If the value begins with the character "@", the stream was created using Relative Basis and the stream name following this character is that of the

parent stream. A stream created using Relative Basis is updated when its parent stream's data changes.

Description

Select information from the menu to describe the particular stream. For example, you can indicate the source component of the stream (for example, From Pump P-103) or tag it with one of the available utility stream names.

Mass Flow

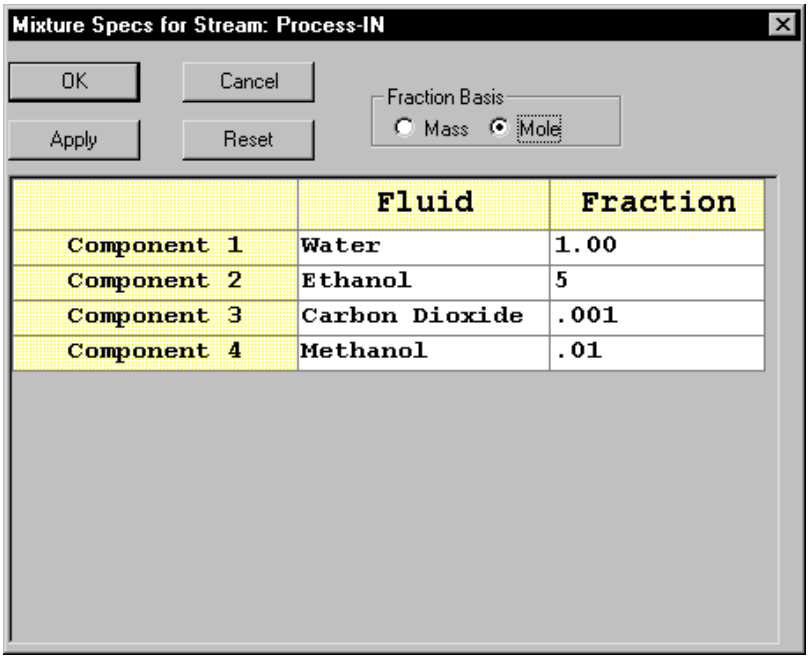
The Mass Flow fields are used to determine the phase of the stream. For instance, if the stream has only Liquid Mass Flow specified, the stream is totally liquid; therefore, it will have no vapor properties estimated for it. The reverse is true for a case with only a Vapor Mass Flow specified. For cases with both types of flow, all properties will be estimated and the Primary Fluid Component will belong to the phase of the largest mass flow. Note Aspen In-Plant Cost Estimator automatically calculates Total Mass Flow from the individual mass flow values.

Density

The Density fields are required information. Thus, if a particular phase has a mass flow rate specified, then the corresponding density must also be specified. Clicking Update will estimate any required density fields based on the flow rate, except in the case of Solid Mass Density. It is recommended that you enter a Liquid Mass Density if one is available.

Mixture Specs Dialog Box

Clicking Mixture on the Develop Stream specifications form accesses the Mixture Specs dialog box.



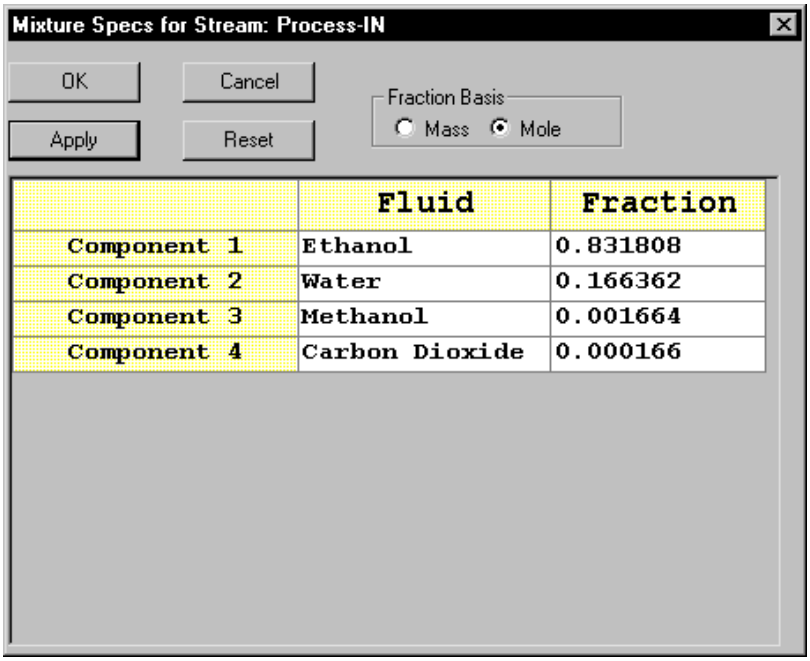
Note: When you click **Apply**, Aspen In-Plant Cost Estimator normalizes the Fraction values to total a sum of one.

The values shown to the right would change into the values shown on the next page.

The mixture information specified in this dialog box is used to estimate properties as a mixture of the specified composition. If no mixture information is present, the stream is assumed to be pure Primary Fluid Component. The fraction information can be entered on either a Mass or Mole Fraction Basis as specified in the Fraction Basis section.

The Cancel and Reset buttons behave in a similar manner as their respective buttons on the Develop Stream specifications form.

The OK and Apply buttons also behave in a similar manner as their respective buttons on the Develop Stream specifications form, except the checking is different. Here, a check is made to ensure that the fractions have a total sum of one. If not, the values are normalized to give a total sum of one, as indicated in the following form.



The check also combines duplicate entries into one entry by combining the two fraction specifications.

After the check is done, the components are sorted in order of decreasing fractional amount as shown above. When you click OK, Aspen In-Plant Cost Estimator loads into the specifications form the name of the fluid with the highest fraction and the properties of the mixture generated from the contributions of the individual components.

Creating a New Stream

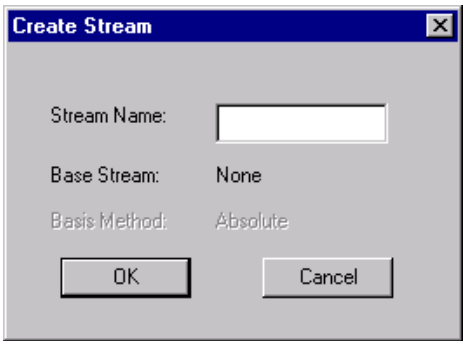
Streams can be created from scratch or by using a base stream.

From Scratch

To create a stream from scratch:

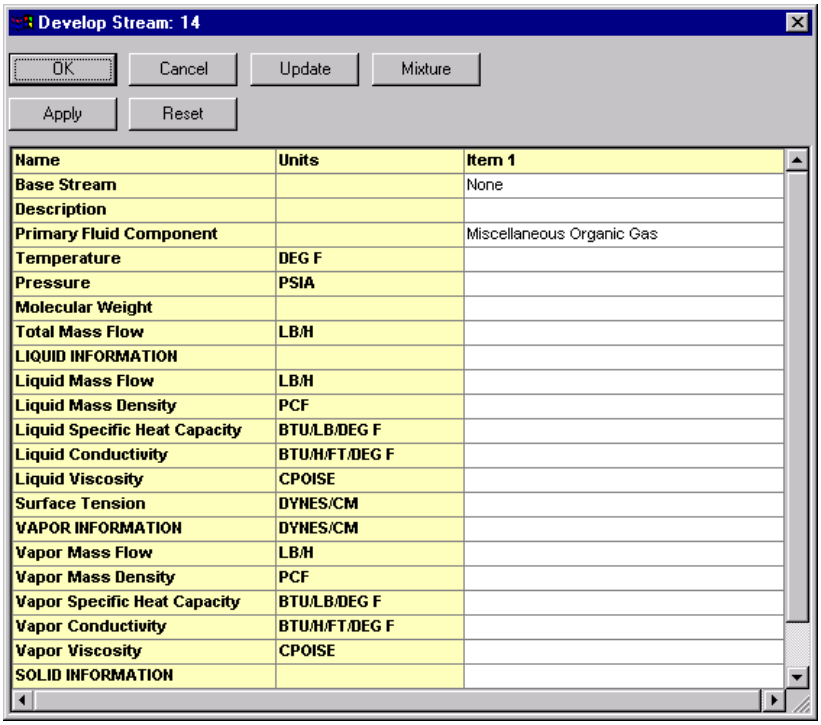
1 Go to the Create tab view on the Develop Streams dialog box. Without selecting a stream from the Base Streams list, click Create. (The Basis selection will not matter.)

The **Create Stream** dialog box appears.



2 Enter a name for the new stream in the Create Stream dialog box. This name must not be the same as any existing streams in the project. Click **OK**.

The **Develop Stream** specifications form appears.



Name	Units	Item 1
Base Stream		None
Description		
Primary Fluid Component		Miscellaneous Organic Gas
Temperature	DEG F	
Pressure	PSIA	
Molecular Weight		
Total Mass Flow	LB/H	
LIQUID INFORMATION		
Liquid Mass Flow	LB/H	
Liquid Mass Density	PCF	
Liquid Specific Heat Capacity	BTU/LB/DEG F	
Liquid Conductivity	BTU/H/FT/DEG F	
Liquid Viscosity	CPOISE	
Surface Tension	DYNES/CM	
VAPOR INFORMATION	DYNES/CM	
Vapor Mass Flow	LB/H	
Vapor Mass Density	PCF	
Vapor Specific Heat Capacity	BTU/LB/DEG F	
Vapor Conductivity	BTU/H/FT/DEG F	
Vapor Viscosity	CPOISE	
SOLID INFORMATION		

Note: See pages 105 and 106 for descriptions of the buttons and fields on this form.

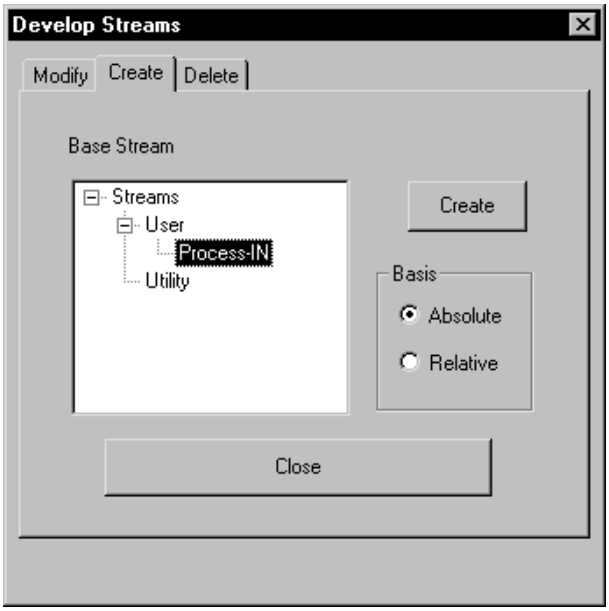
3 Enter values for the new stream. See page 106 for descriptions of the different fields.

4 When done, click **OK**.

Using a Base Stream

To create a stream based on an existing stream:

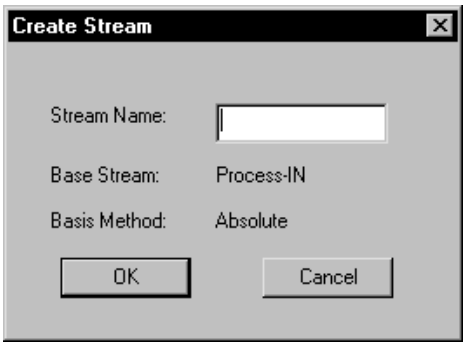
1 At the **Create** tab view on the **Develop Streams** dialog box, select the stream to be used as the base.



2 Select the **Basis** mode. If the Basis mode is Relative, the data from the two streams will be linked so that when the base stream is changed the new stream will inherit these changes. If the Basis mode is Absolute, the data from the base stream is copied to the new stream at the time the new stream is created. Changes in a base stream will not affect a new stream created via Absolute basis.

3 Click **Create**.

The **Create Stream** dialog box appears.

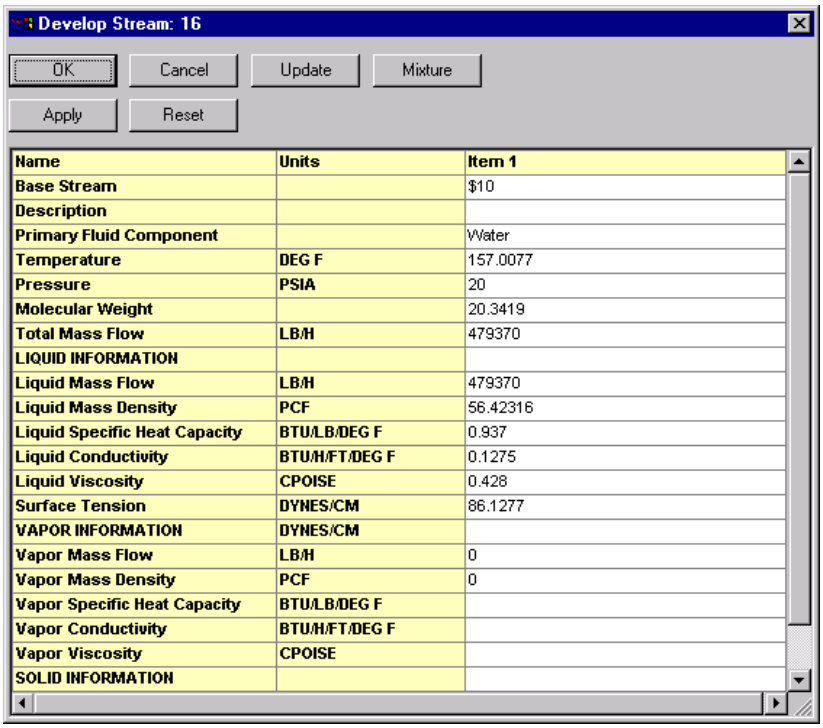


4 Enter a name for the new stream in the **Create Stream** dialog box. This name must not be the same as any existing streams in the project.

5 Click **OK**.

Aspen In-Plant Cost Estimator displays the specifications form for the newly created stream. The data is that of the Base Stream.

Data appears gray (dimmed) to indicate that it is relative to a referenced Base Stream. Even in a Relative Stream, you may override any value with a manual entry. If you do so, the text turns black, indicating that that value is absolute and therefore no longer references a Base Stream.



Name	Units	Item 1
Base Stream		$10
Description		
Primary Fluid Component		Water
Temperature	DEG F	157.0077
Pressure	PSIA	20
Molecular Weight		20.3419
Total Mass Flow	LB/H	479370
LIQUID INFORMATION		
Liquid Mass Flow	LB/H	479370
Liquid Mass Density	PCF	56.42316
Liquid Specific Heat Capacity	BTU/LB/DEG F	0.937
Liquid Conductivity	BTU/H/FT/DEG F	0.1275
Liquid Viscosity	CPOISE	0.428
Surface Tension	DYNES/CM	86.1277
VAPOR INFORMATION	DYNES/CM	
Vapor Mass Flow	LB/H	0
Vapor Mass Density	PCF	0
Vapor Specific Heat Capacity	BTU/LB/DEG F	
Vapor Conductivity	BTU/H/FT/DEG F	
Vapor Viscosity	CPOISE	
SOLID INFORMATION		

Note: See pages 105 and 106 for descriptions of the buttons and fields on this form. See page 106 for descriptions of the different fields.

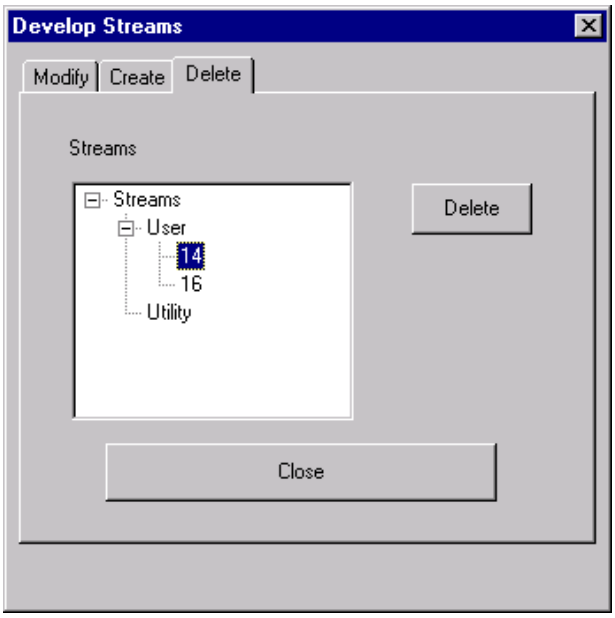
6 Make modifications to the data and click **OK**.

Deleting a Stream

Note: Only user-added streams and streams added by the Sizing Expert as utilities can be deleted.

To delete a stream:

1 At the **Delete** tab view on the **Develop Streams** dialog box, select the stream to be deleted. You may need to use the scrollbars to locate a stream if a large number of streams exist in the current project.



2 Click **Delete**.

A dialog box will appear asking for confirmation of the delete action.

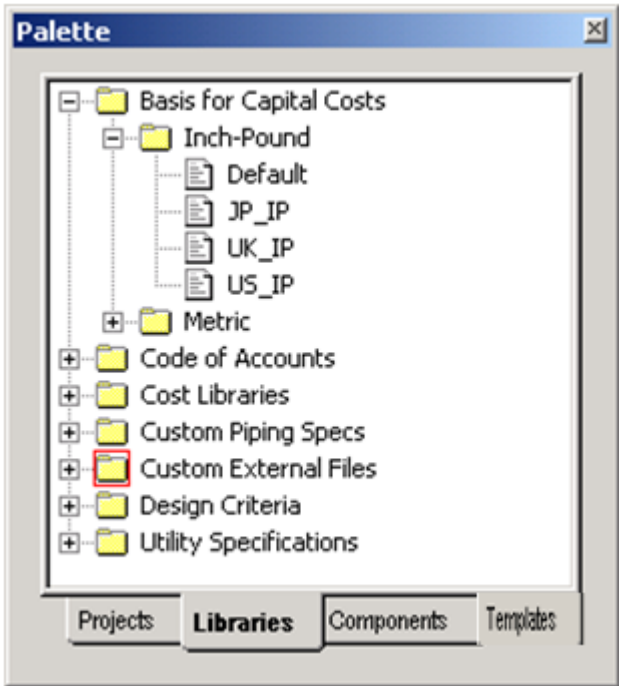
3 Click **OK** to delete the stream.

-or-

Click **Cancel** to retain the stream.

Specification Libraries

The default specifications are derived from files that you can access, when outside of a project, from the Palette's Libraries view.



It includes specification files for the following:

- Basis for Capital Costs
- Code of Accounts
- Cost Libraries (see Chapter 6, "Developing and Using Cost Libraries")
- Custom Piping Specs
- Customer External Files
- Design Criteria
- Utility Specifications

When you create a project scenario, Aspen In-Plant Cost Estimator selects the specification file to use based upon the selected units of measure basis. However, you can right-click on any of the above Project Basis specification categories in Project Explorer, click Select on the pop-up menu, and select a different file from which to derive the default specifications.

Customizing Specification Libraries

When no project is open, you can create your own specification files or edit existing files. Then, when in a project, you can select your specification files. For example, if you frequently created project scenarios that used the same design basis, you could create a Basis for Capital Costs specification file with those design basis specifications. Then you could just select this file, instead of entering the specifications every time.

If, after making modifications to your libraries, you wish to revert to the original libraries, you can copy or import the copy of the installed libraries provided in the following folder:

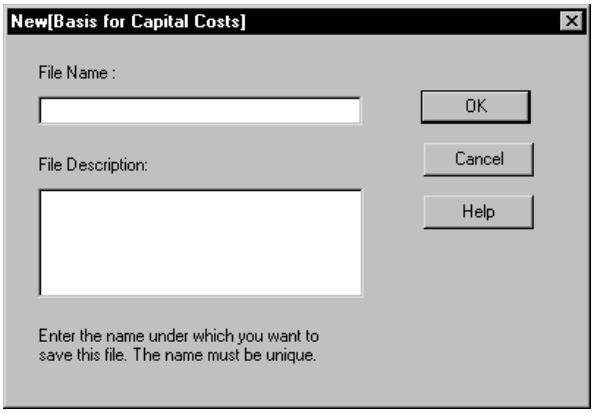
…\AspenTech\Economic Evaluation V7.3\Program\Sys\Libraries

Creating a File

To create a specification file:

1. With no project open, go to the Libraries tab view in the Palette.
2. Expand the desired specification category.
3. Right-click on the units of measure basis folder – Inch-Pound or Metric – and click New on the pop-up menu, unless you are creating a Code of Accounts library, in which case right-click on the Code of Accounts folder and click New on the pop-up menu.

The New <*Specification Category*> dialog box appears.


New[Basis for Capital Costs]
File Name :
OK
Cancel
File Description:
Help
Enter the name under which you want to save this file. The name must be unique.

4. Enter a file name and, if desired, a file description.
5. Click **OK**.

Aspen In-Plant Cost Estimator creates the file and displays the specifications in a separate window.

6. Edit the specifications just as in a project.
7. When you are done, close the specifications window. If a library file is open, you cannot access another library file or open a project.

See page 116 for instructions on selecting the newly created file for use in a project scenario.

Modifying a File

To modify an existing specification file:

1. Right-click the file in the Palette (**Libraries** view).
2. On the menu that appears, click **Modify**.

Importing a File

You can import specification files from elsewhere on your computer or network.

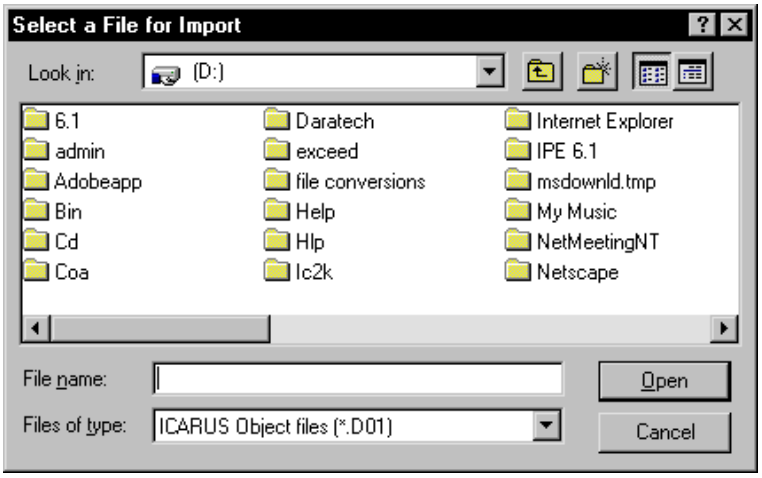
To import a file:

1 In the Palette (Libraries view), expand the library to which you wish to import a file, right-click on the appropriate Units of Measure basis (Inch-Pound or Metric), and then click Import on the pop-up menu. If importing a Code of Accounts library, right-click on the Code of Accounts folder and click Import on the pop-up menu.

2 In the Select a File for Import dialog box, locate the file and then click Open.

Specification files have the following extensions:

- Basis for Capital Costs: Aspen In-Plant Cost Estimator
- Custom Pipe Specs: DAT, SPC
- Design Criteria and Utility Specifications: D01
- Cost Libraries: EML, UCL



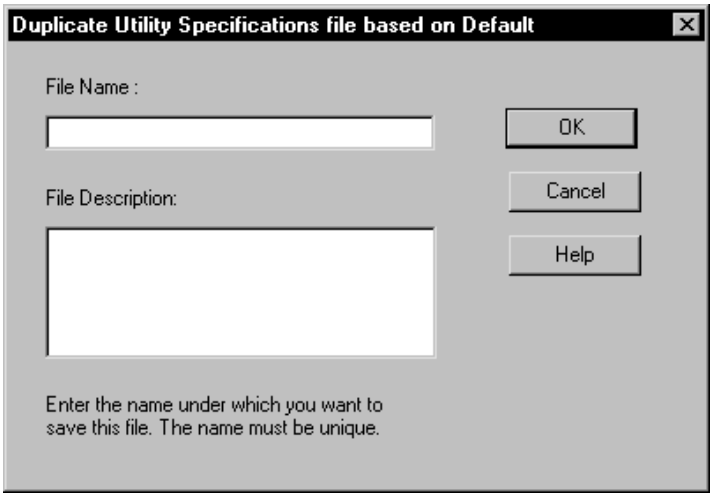
The file is copied to the appropriate sub-folder.

Duplicating a File

To duplicate a file:

1 In the Palette (Libraries view), right-click on the file you wish to duplicate, and then click Duplicate on the pop-up menu.

2 Enter a file name and description (optional) for the new file.


Duplicate Utility Specifications file based on Default
File Name :
OK
Cancel
File Description:
Help
Enter the name under which you want to save this file. The name must be unique.

3 Click **OK**.

Aspen In-Plant Cost Estimator creates the file and displays the specifications in a separate window.

Edit the specifications just as in a project.

When you are done, close the specifications window. If a library file is open, you cannot access another library file or open a project.

See page 116 for instructions on selecting the newly created file for use in a project scenario.

Deleting a File

To delete a specification file:

1 On the Palette (**Libraries** view), right-click the file to be deleted.

2 On the menu that appears, click **Delete**.

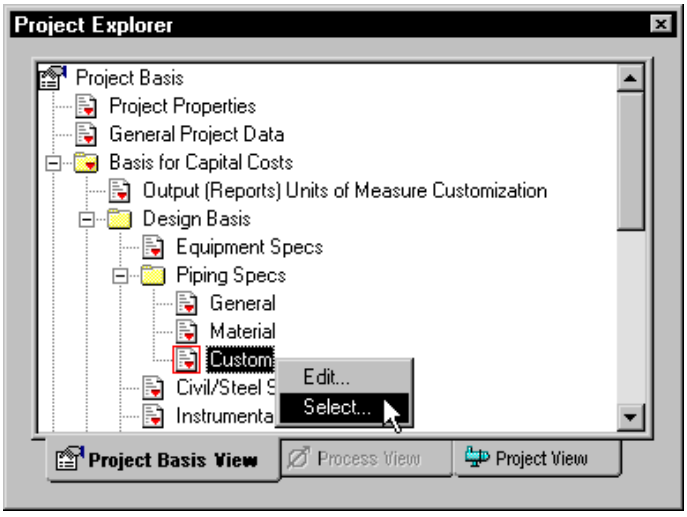
Note: You cannot delete files named **Default**; you can only modify them.

Selecting a Specification File for Use in a Project

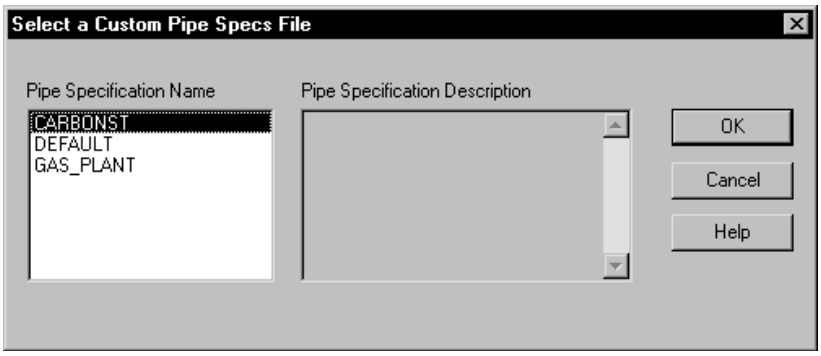
After creating a new specification file, you still need to select it in Project Explorer for Aspen In-Plant Cost Estimator to use its specifications.

To select a specification file:

1 Open the project scenario in which you wish to use the file. In Project Explorer (Project Basis view), right-click on the appropriate specification category and click Select on the pop-up menu.



Aspen In-Plant Cost Estimator displays a dialog box listing the files available for the selected category.



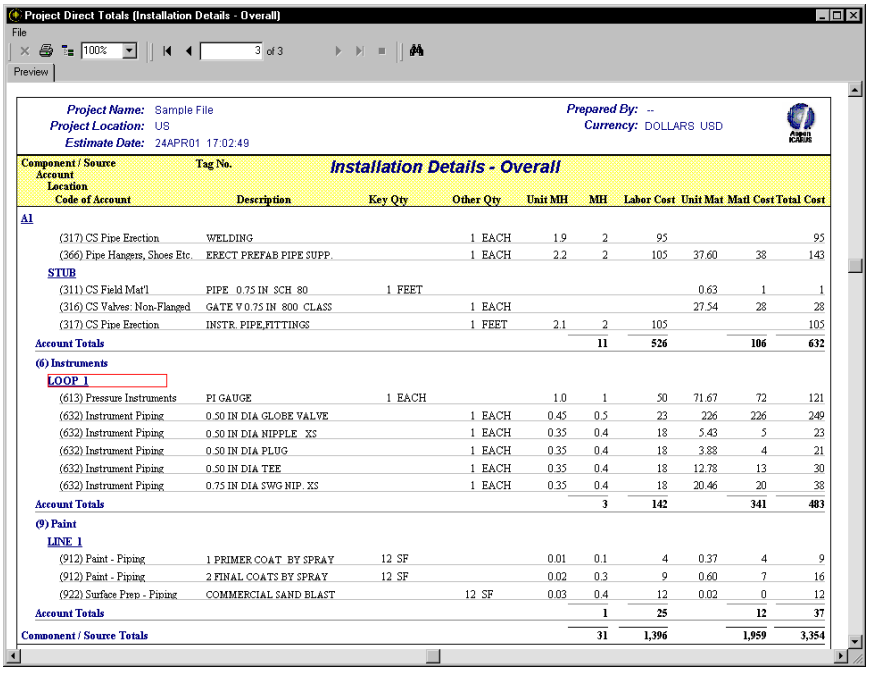
2 Select a new file from which to derive default specifications and click OK.

Changing File Directory Location

If you decide to store specification library files in a directory other than the default, move the default files to the new location and recreate the same sub-folder arrangement. Otherwise, Icarus will generate an error when you point to the new location.

Instrument Field Hook-Up Customization

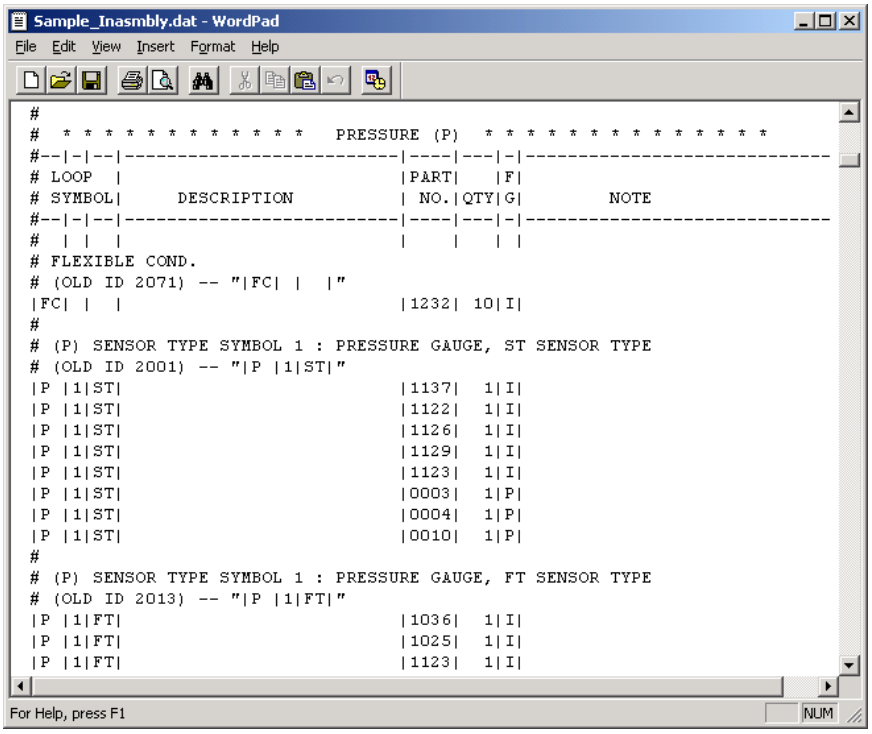
When you include a component with an instrumentation loop in your project, Aspen In-Plant Cost Estimator accounts for instrument field hook-up in the project's direct costs and includes the parts for the instrument field hook-up on the Direct Costs – Overall Installation Details report.


Project Direct Totals (Installation Details - Overall)
File
Preview
Project Name: Sample File
Project Location: US
Estimate Date: 24APR01 17:02:49
Prepared By: --
Currency: DOLLARS USD
Installation Details - Overall
Component / Source
Account
Location
Tag No.
Code of Account
Description
Key Qty
Other Qty
Unit MH
MH
Labor Cost
Unit Mat
Matl Cost
Total Cost
A1
(317) CS Pipe Erection WELDING 1 EACH 1.9 2 95 95
(366) Pipe Hangers, Shoes Etc. ERECT PREFAB PIPE SUPP. 1 EACH 2.2 2 105 37.60 38 143
STUB
(311) CS Field Mat'l PIPE 0.75 IN SCH 80 1 FEET 0.63 1 1
(316) CS Valves: Non-Flanged GATE V 0.75 IN 800 CLASS 1 EACH 27.54 28 28
(317) CS Pipe Erection INSTR. PIPE,FITTINGS 1 FEET 2.1 2 105 105
Account Totals 11 526 106 632
(6) Instruments
LOOP 1
(613) Pressure Instruments PI GAUGE 1 EACH 1.0 1 50 71.67 72 121
(632) Instrument Piping 0.50 IN DIA GLOBE VALVE 1 EACH 0.45 0.5 23 226 226 249
(632) Instrument Piping 0.50 IN DIA NIPPLE XS 1 EACH 0.35 0.4 18 5.43 5 23
(632) Instrument Piping 0.50 IN DIA PLUG 1 EACH 0.35 0.4 18 3.88 4 21
(632) Instrument Piping 0.50 IN DIA TEE 1 EACH 0.35 0.4 18 12.78 13 30
(632) Instrument Piping 0.75 IN DIA SWG NIP. XS 1 EACH 0.35 0.4 18 20.46 20 38
Account Totals 3 142 341 483
(9) Paint
LINE 1
(912) Paint - Piping 1 PRIMER COAT BY SPRAY 12 SF 0.01 0.1 4 0.37 4 9
(912) Paint - Piping 2 FINAL COATS BY SPRAY 12 SF 0.02 0.3 9 0.60 7 16
(922) Surface Prep - Piping COMMERCIAL SAND BLAST 12 SF 0.03 0.4 12 0.02 0 12
Account Totals 1 25 12 37
Component / Source Totals 31 1,396 1,959 3,354

The defaults are detailed in two ASCII files, Sample_Inasmbly.dat and Sample_Inparts.dat, stored in the UserData folder.

You can customize the instrument field hook-ups. Open and modify these files in Wordpad or any other ASCII text editor and then save the files as **Inasmbly.dat** and **Inparts.dat**.

The **Sample_Inasmbly.dat** file is shown below.


Sample_Inasmbly.dat - WordPad
File Edit View Insert Format Help
#
* * * * * * * * * * * * * PRESSURE (P) * * * * * * * * * * * * * * * *
#--|-|--|-------------------------|----|---|-|-----------------------------
LOOP | |PART| |F|
SYMBOL| DESCRIPTION | NO.|QTY|G| NOTE
#--|-|--|-------------------------|----|---|-|-----------------------------
| | | | | | | |
FLEXIBLE COND.
(OLD ID 2071) -- "|FC| | |"
|FC| | | |1232| 10|I|
#
(P) SENSOR TYPE SYMBOL 1 : PRESSURE GAUGE, ST SENSOR TYPE
(OLD ID 2001) -- "|P |1|ST|"
P	1	ST		1137	1	I
P	1	ST		1122	1	I
P	1	ST		1126	1	I
P	1	ST		1129	1	I
P	1	ST		1123	1	I
P	1	ST		0003	1	P
P	1	ST		0004	1	P
P	1	ST		0010	1	P
#
(P) SENSOR TYPE SYMBOL 1 : PRESSURE GAUGE, FT SENSOR TYPE
(OLD ID 2013) -- "|P |1|FT|"
P	1	FT		1036	1	I
P	1	FT		1025	1	I
P	1	FT		1123	1	I
For Help, press F1
NUM

There are extensive instructions for use provided toward the top of the scrollable document. Be sure to read these carefully before modifying. The editor must not introduce non-printing characters other than a space or CR/LF, that is, no tabs are allowed.

The field hook-up assembly data is organized into the following columns:

LOOP SYMBOL: Symbol that describes the sensor loop.

DESCRIPTION: Place for comments; does not affect usage.

PART NO.: A reference to the part number in **Inparts.dat** file for the part used in this assembly.

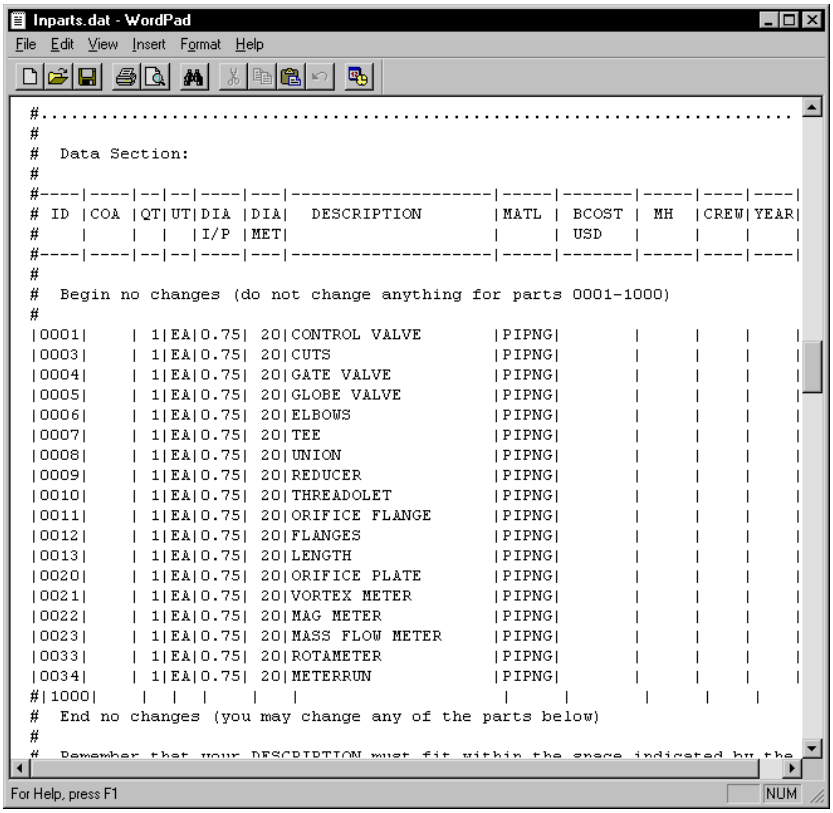
QTY: Quantity of this part to include in this assembly.

FG: Flag identifying this part as Piping or Instrumentation. The Piping parts are drawn from items in **Inparts.dat** with IDs of 1,000 or less. Their material of construction matches the material on the process side (component or pipe). These parts are the ones eliminated when you turn off the "process connection" when defining modifications to a loop. The Instrumentation parts are drawn from the remaining items in Inparts.dat, which includes specifications for their materials of construction.

Note: Additional place for comments; does not affect usage.

By changing the part types and quantities for each, you change the results developed for the field hook-ups. You may delete the parts of a hook-up, you may revise each line, and you may add parts to a particular field hook-up from Inparts.dat.

The **Sample_Inparts.dat** file is shown below:


Inparts.dat - WordPad
File Edit View Insert Format Help
#.....
#
Data Section:
#
#----|----|--|--|----|---|--------------------|-----|-------|-----|----|----|
ID |COA |QT|UT|DIA |DIA| DESCRIPTION |MATL | BCOST | MH |CREW|YEAR|
| | | |I/P |MET| | | USD | | | |
#----|----|--|--|----|---|--------------------|-----|-------|-----|----|----|
#
Begin no changes (do not change anything for parts 0001-1000)
#
0001		1	EA	0.75	20	CONTROL VALVE	PIPNG				
0003		1	EA	0.75	20	CUTS	PIPNG				
0004		1	EA	0.75	20	GATE VALVE	PIPNG				
0005		1	EA	0.75	20	GLOBE VALVE	PIPNG				
0006		1	EA	0.75	20	ELBOWS	PIPNG				
0007		1	EA	0.75	20	TEE	PIPNG				
0008		1	EA	0.75	20	UNION	PIPNG				
0009		1	EA	0.75	20	REDUCER	PIPNG				
0010		1	EA	0.75	20	THREADOLET	PIPNG				
0011		1	EA	0.75	20	ORIFICE FLANGE	PIPNG				
0012		1	EA	0.75	20	FLANGES	PIPNG				
0013		1	EA	0.75	20	LENGTH	PIPNG				
0020		1	EA	0.75	20	ORIFICE PLATE	PIPNG				
0021		1	EA	0.75	20	VORTEX METER	PIPNG				
0022		1	EA	0.75	20	MAG METER	PIPNG				
0023		1	EA	0.75	20	MASS FLOW METER	PIPNG				
0033		1	EA	0.75	20	ROTAMETER	PIPNG				
0034		1	EA	0.75	20	METERRUN	PIPNG				
#|1000| | | | | | | | | | |
End no changes (you may change any of the parts below)
#
For Help, press F1
NUM

There are extensive instructions for use provided toward the top of the scrollable document. Please read these carefully before modifying the file, with the same limitations as described above.

The field hook-up assembly parts are organized into the following columns:

ID: A unique, four-digit part number. This shows up as the PART No. in Inasmbly.dat.

COA: A valid Icarus instrumentation Code of Account (COA). You should use an Icarus COA even if you plan to redefine the COA sets (see Icarus Reference, Chapter 34, “Code of Accounts”).

QT: Quantity- must be set to 1.

UT: Unit of measure.

DIA I/P: Diameter (if applicable) in Inch-Pound (IP) units. This is included in the line item details print out to identify the item.

DIA MET: Same as above, but for Metric.

DESCRIPTION: Name for the line item to print in the details section of reports.

MATL: One of the valid Icarus materials of construction listed in the file.

BCOST (USD): Material cost of the part in USD for the YEAR indicated in the file. This will be automatically converted to the currency of the project. The currency units are not important- the USD symbol here is for reference purposes only. You may change the symbol and/or enter your own cost values. However, it is critical that you enter the conversions between this currency and the four country currencies known to Icarus. That is done using the four CURCONs listed in the file.

MH: Installation man-hours per indicated quantity (for example, per LF or M, EA, etc).

CREW: Select one of the available Icarus instrumentation crews to perform the work.

YEAR: The system will automatically escalate the user-entered material cost (see above, under BCOST) to the base year for the version of Aspen In-Plant Cost Estimator that is running the estimate.

For example, if a cost is specified as being valid in 2000, and you are running a First Quarter 2002 (1Q ’02) version of the system, then the cost in this file will be escalated to 1Q ‘02 before appearing in any report. It is important to note that the escalation index used is specific for the instrumentation account. This usually differs from the global system base indices listed in the Icarus Reference. The Release Notes provided with each cost release details the year-to-year changes by major account.

4 Loading and Mapping Simulation Data

Overview

If the process you wish to evaluate in IPE is based on a simulator file report from a process simulator software program, the first step, after creating a project scenario and defining the Design Basis, is to load and map simulation data.

IPE supports reports from the following simulators:

- AspenTech's AspenPlus Version 12.1
- Chemstations' ChemCAD for Windows Version 5.3.2
- Hyprotech's HYSIM Version STD/C.271
- Hyprotech's HYSYS Version 2.4.1
- SimSci's PRO/II with PROVISION Version 5.61
- Pacific Simulation's WINGEMS 2.0
- WinSim's DESIGN II for Windows Version 8.17

Preparing Simulation Reports

For IPE to load the simulation data, an appropriate ASCII output report needs to be generated from the simulator. Most simulators describe the various steps needed to generate ASCII reports. This section provides additional procedures to generate reports in an Analyzer-compatible format.

The procedures provided here start with the default report generation options. If changes have been made from the default report generation options, then it may be necessary to change them back to the default settings for creating an output report for IPE.

AspenPlus Report Generation

AspenPlus provides a template containing the property sets that a project needs in order to generate an output report for IPE.

Note: If you use the template, the following component specification, if entered in AspenPlus, must be re-entered in IPE:

Block - CCD

STAGE EFFICIENCY

To use the template:

1. Open the project in AspenPlus.
2. On the **File** menu, click **Import**.
3. Navigate to:

```
Program Files\AspenTech\Economic Evaluation V7.3\Program\Load
```

Note: This is the default path; it may differ depending on where you installed Aspen Icarus.

4. Depending on the simulation units of measure, select the appropriate simulator directory (for example, AspenPlus) and then the corresponding template (**.apt**) file.

To create the required property steps in Aspen Plus without using a template:

1. On the **Data** menu, click **Properties**. This will open the data browser to the property specifications.
2. In the data browser tree structure, open the folder Prop-Sets located in the Properties folder.
3. Click **New** to create a new property set.
4. Type a name for the property set or use the default name.
5. Click **OK**.
6. In the **Substream** field, select **All**.
7. Scroll down the list of available properties, clicking those you wish to select. To start the scroll window, click in a physical properties cell:
    - MASSVFRA
    - MASSSFRA
    - MASSFLMX
    - VOLFLMX
    - MASSFLOW
    - TEMP
    - PRES
    - MWMX

The specifications for this property set are complete as indicated by the check mark displayed on the tree view of the data browser.

8. Click the **Prop-Sets** folder. You will see the property set you just created in the object manager and the status should be **Input Complete**.
9. Create the second property set by once again clicking **New**.
10. Type a name for the property set or use the default name.
11. Click **OK**.
12. Click the **Qualifiers** tab.
13. In the **Phase** cell, click **Total**.
14. Click the **Properties** tab.

15 In the **Substream** field, click **ALL**.

16 Now click the **Units** cell corresponding to the **CPMX** property and pick either of the following units:

- KJ/KG-K

-or-

- BTU/LB-R

The specifications for this property set are complete.

17 Click the **Prop-Sets** folder. The newly created property set will appear in the object manager with an **input complete** status.

18 Create the final property set needed by IPE by clicking **New**.

19 Type a name for the property set, or use the default name.

20 Click **OK**.

21 Click the **Qualifiers** tab.

22 In the **Phase** cell, click **Vapor**.

23 Click the **Properties** tab.

24 Select the following properties for this property set:

- VOLFLMX
- MASSFLMX
- KMX
- MUMX
- CPMX
- MWMX

25 Now click the **Units** cell corresponding to the **CPMX** property and pick either of the following units:

- KJ/KG-K

-or-

- BTU/LB-R

The creation of property sets is complete.

Now these property sets must be specified for use in the generation of a report.

To specify these property sets for use in report generation:

1 If the **Setup** folder is not already expanded, expand it by clicking on the plus sign next to the folder symbol.

2 Click **Report Options**.

3 Click the **Stream** tab.

4 Click the **Property Sets** button.

5 Move the three property sets you just created to the **Selected property sets** box.

6 Click the **>** button to move them to the **Selected property sets** box.

7 Click **Close**.

The specifications required for loading an AspenPlus report file are now complete. You can close the data browser window.

After running the simulation, you must create an output report.

To create an output report:

1. On the **File** menu, click **Export**.
2. In the **Save As** dialog box, use the drop-down menu to select **Report Files** (***.rep**) or **XML files** (***.xml**).
3. Type a file name or accept the default value.
4. Click **Save**. This will create the ASCII report file needed to load into IPE with the name given above.

Note: The order on any of the **tower** models must be set to TOP-DOWN in order for the tray information to get loaded into IPE correctly. This is the default setting.

Aspen Plus Utilities

If a unit operation block has a utility specified, the utility resource specifications and usage data will be transferred into IPE. After loading the simulator data, a preference screen will appear. Specify any missing data for the Aspen Plus utilities in order for the Aspen Plus utility to be properly handled. The Aspen Plus utilities will appear as new utility resources. The appropriate project components will use the specified utility resource, based on the Aspen Plus utility used in the simulation.

A message box will appear if utility resources are modified or deleted from the Aspen Plus simulation prior to a reload of data into IPE. You can choose to delete the old imported Aspen Plus utility resources in IPE, or just add/update existing imported utilities in Aspen Plus.

AspenPlus – IPE Simulator link

A link from AspenPlus to IPE lets you load changes into IPE when simulation settings are changed in AspenPlus.

To load process simulator data through the Aspen Icarus link into a new IPE project scenario:

1. Run the simulation in AspenPlus.
2. On the **File** menu, click **Send To** and click **Aspen Icarus**.

When the prompt appears, the IPE project name will be designated to be the name of the simulation file from AspenPlus. AspenPlus will designate the scenario name. If the scenario name is changed, any future attempts to run the link for the same project will result in a new IPE project being created. It is recommended that the scenario name designated by AspenPlus be left as it is for maximum usability.

3. Click **OK**.

The **Project Properties** dialog box appears.

4 Specify the Project Description, Remarks, and the Units of Measure.

5 Click **OK**.

The **Input Units of Measure Specifications** dialog box appears.

6 Verify the Input Units of Measure Specifications; then click **OK**.

The **General Project Data** dialog box appears.

7 Verify the General Project Data; then click **OK**.

IPE displays a prompt to load the Simulator Data.

8 Click **OK**.

If the simulation has specified units that are undefined, a prompt will appear to do so. Define all AspenPlus units with those available in IPE.

To load process simulator data through the Aspen Icarus link into an existing project scenario:

1 Run the simulation in AspenPlus

2 On the **File** menu, click **Send To** and click **Aspen Icarus**.

IPE displays a prompt to load simulator data.

3 Click **OK**.

Because all other project basis settings have been specified, mapping and sizing can be performed at this time.

ChemCAD Report Generation

These instructions apply to both ChemCAD for Windows, Version 5.3.2, and for previous versions of ChemCAD. The specifications are the same for all versions.

1 On the main menu, on the Output menu, click Report.

Note: In ChemCAD for Windows, just click the **Output** menu from the menu bar.

2 Specify the following for report options:

- Select Streams
- Print All Streams: **Y**

  Note: Check box in ChemCAD for Windows
- Select Unit Operations
- Print All Unit Operations: **Y**

  Note: Check box in ChemCAD for Windows.
- Stream Properties

3 Select or deselect the following stream properties as indicated below:

Property	Select	De-Select
OVERALL PROPERTIES		
Mass flow rate	X	

Property	Select	De-Select
Mole flow rate		X
Temperature	X	
Pressure	X	
Mole Vap frac	X	
Enthalpy	X	
Molecular wt.	X	
Total act.dens	X	
VAPOR PROPERTIES		
Mass flow rate	X	
Mole flow rate		X
Molecular wt.	X	
Vap. Act. Dens	X	
Vap. Viscosity	X	
Vap. Cp	X	
Vap. Thrm. Cond	X	
Liq. Surf. Tens.	X	
LIQUID PROPERTIES		
Mole flow rate		X
Molecular wt.	X	
Liq. act. Dens	X	
Liq. Viscosity	X	
Liq. Cp	X	
Liq. Thrm. Cond.	X	
SOLID PROPERTIES*		
Mass flow rate	X	
Molecular wt.	X	
Density	X	
PSD	X	
DISTILLATION OPTIONS		
Tray profile	X	
Tray properties	X	
Tray sizing	X	
Packed column sizing	X	
TRAY COMPOSITIONS		
Mass flow rate	X	

* Solid properties are located on Page 2 of Stream Properties in ChemCAD for Windows.

The component mass flow rates for individual streams must be included in the output report.

4 Navigate to the **Stream Flowrate/Composition** menu under the **Reports/Output** menu.

5 Pick **Mass Flowrate**.

If you want IPE to use tray sizing information from the simulator, then you must include the appropriate sizing information.

6 To do this, go to **Distillation Summaries** under the **Reports/Output** menu; then select the appropriate sizing section (**packed** or **trayed**).

7 After the completion of all these specifications, generate the output report by selecting **Calculate** and **Give Results**. This should generate an output report. You can rename it if you wish. This is the file to be used as input for IPE.

HYSIM Report Generation

1 Copy the following .**spc** files from the **\Program\Load\Hysim** directory to your HYSIM working directory before generating output inside the simulator.

- MIXER.SPC
- TEE.SPC
- HTXRATE.SPC
- BALANCE.SPC
- CALC.SPC
- MASSBAL.SPC
- MOLEBAL.SPC

For all other operations, use the defaul**t .spc** files provided by Hyprotech.

2 For HYSIM version 386|C2.12 or earlier, copy the stream format file **STRSUM.FMT** located in the **/IPE/Docs** directory of your HYSIM working directory. If you have HYSIM version STD:C2.63 and above, copy the stream format file **STRSUM2.FMT** located in the **/IPE/Docs** directory to your HYSIM working directory and rename it STRSUM.FMT. You must either delete or rename the existing **STRSUM.FMT** file to perform this.

The output report generated from HYSIM should contain ***operation output*** (defined as spec_sheet in HYSIM) and the complete ***stream summary***. Both of these outputs must be saved under the same file name. The information is appended to the file and does not get overwritten.

To generate the *operation output* and *stream summary* (Required):

1 Load the desired project inside HYSIM (***.sim**).

- operation output
- stream summary

2 On the main menu, click **Print**.

3 On the **print** option, click **File**; then press **Enter**.

4 Select the ***same*** file (***file_name***) as above; then press **Enter**.

5 Click the **Print** option; then press **Enter**.

6 Select the **Stream** option; then press **Enter**.

7 Inside the **Stream** option, select **Summary**; then press **Enter**.

8 The list of streams present in the current project is displayed. Click the <-> option for all the streams to be written in ***file_name***.

The procedure creates the required report (***file_name***), which can be loaded into IPE and used for project evaluation.

If sizing operations are performed inside the simulator and you want the information to be carried over to IPE, the following steps must be performed in addition to the above procedure:

1. Load the desired project inside HYSIM (***.sim**).

   sizing summary
2. On the main menu, click **Size**.
3. Inside the **size** option, choose the unit operation desired; then press **Enter**.
4. Select the particular equipment (for example, *col-101*) ; then press **Enter**.
5. Select ***auto_section*** or ***user_section***; then press **Enter**.
6. After the sizing calculations are performed, select **Print**.
7. Select **File**; then press **Enter**.
8. Select the same file name (*file_name*) ; then press **Enter**.
9. Click **Summary**; then press **Enter**.

Important:

- The operation names and stream names can not contain the following characters:

  +, -, *, or spaces
- The ASCII report has to be created in the default units specified by HYSIM for the ENGLISH and the SI modes of operation. You can run a simulation in any simulator-provided units. However, prior to creating the report file, you must convert the units to the default specifications provided by HYSIM.
- During the sizing procedure for the **column** operation, if **user_section** is chosen, care should be taken to check that the stage numbers are not repeated in the different sections of the same column operation. The following two examples demonstrate the correct and incorrect specifications.

Correct		**Incorrect**	
user_section_1 :	(start stage) 1	user_section_1 :	(start stage) 1
	(end stage) 10		(end stage) 10
user_section_2:	(start stage) 11	user_section_2 :	(start stage) 3
	(end stage) 15		(end stage) 15

- The **user_section** name should not contain the following characters:

  +, -, *
- The report format should be such that the width of the report should be less than or equal to 4 streams wide. This can be accomplished from the **format** option provided in HYSIM.
- **Stream summary** should follow the **operation output** in the report, that is, the order should be maintained.

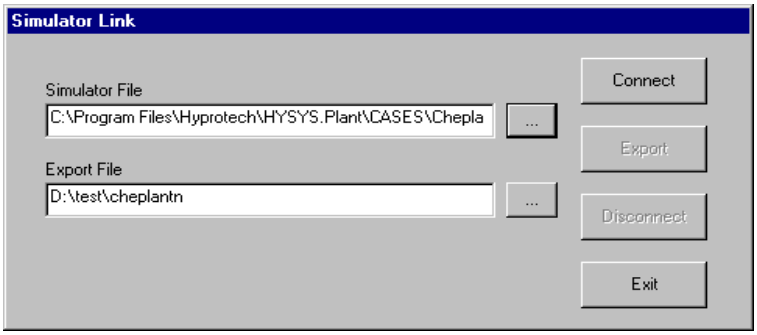
HYSYS Report Generation

IPE's External Simulation Import Tool imports HYSYS simulator data into Icarus database files, which you can then load into IPE.

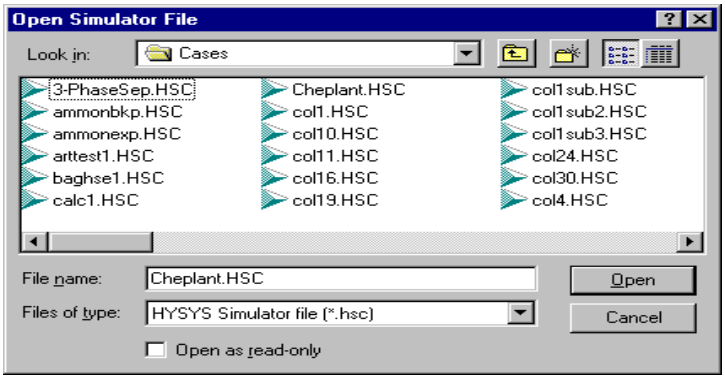
To import HYSYS simulation data for loading into IPE:

1 On the **Tools** menu, click **External Simulation Import Tool.**

The **Simulator Link** dialog box appears.

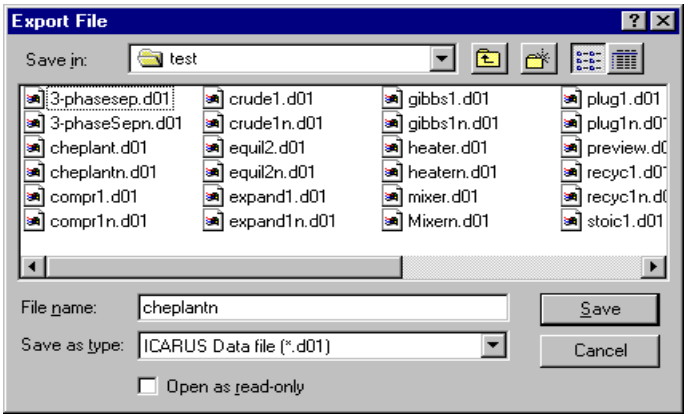


2 Click the **Browse** button for the **Simulator File** field.



3 Select the process simulator project you created; then click **Open**.

4 Click the **Browse** button for the **Export File** field. The Export File will contain the exported simulation results data from the selected HYSYS project. Do not include any file extensions for this file. The import tool will automatically assign a **d01** extension to this file.

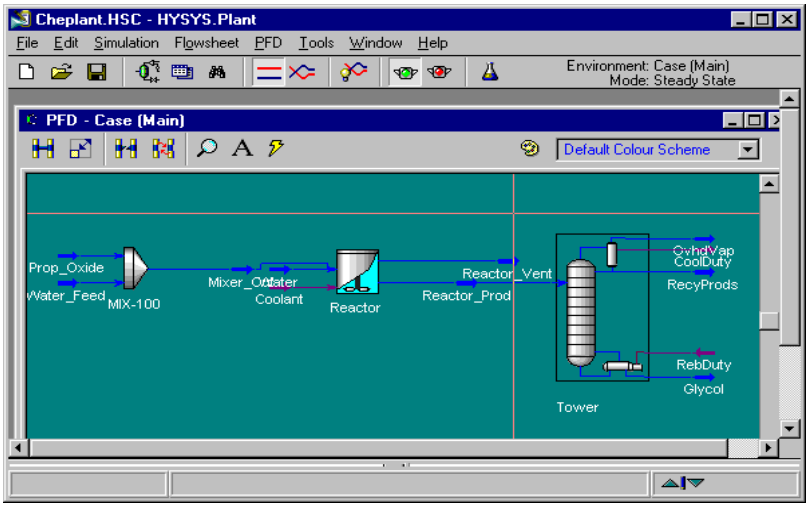


5 Select the location and enter the file name you want to be used to contain the exported data. You can also select an existing file.

6 Click **Save**.

7 On the **Tools** menu, click **Connect.** HYSYS will automatically start with the selected project.

The following figure shows the file **Cheplant.hsc** in the HYSYS interface.



8 Click **Export** on the **Simulator Link** dialog box to start the process of exporting the simulation data from the selected HYSYS project into the **Export** File.

Once finished, you will see five files with the name you gave to the **Export File**. These files contain the exported data.

Note: These files should always go together, in case you want to copy them to another location.

D:\test\cheplantn.d01 ← *Icarus database file*

D:\test\cheplantn.d02

D:\test\cheplantn.d03

D:\test\cheplantn.d04

9 On the **Simulator Link** dialog box, click **Disconnect**. The tool will close HYSYS. If you want to keep HYSYS running and make changes to your simulation, you can use the **Export Again** button to export the data again into the **Export File**.

10 Exit the import tool.

11 Start IPE and create a new project.

12 Select Hyprotech's **HYSYS** as the Simulator Type.

13 When selecting the simulator report file, select the **Export File** (the file with the extension **.d01**) created using the import tool

14 To load, map, and size this project, continue as described in this guide.

SimSci's PRO/II with PROVISION Report Generation

Two methods can be used for generating reports from PRO/II with PROVISION.

- You can change the input keyword file (***.inp**) to include the required print options using keywords for those using PRO/II directly

-or-

- You can change the print options from within the PROVISION user interface.

For either method, the operation names and stream names should not contain the following characters:

- +
- *

Note: When specifying sidestrippers, each sidestripper must be identified by a unique four-character name. Currently, sidestrippers are not always identified by their full user-given names in PRO/II with PROVISION report files. Sometimes, they are identified by only the first four characters of the user-given names. Therefore, to properly load sidestripper information into IPE, sidestripper Unit identifiers (UID's) must be used, which are only four characters long.

To prepare the SimSci report in PROVISION:

1. On the **Input** menu, select **Problem Description**. Make sure that the **Problem Identifier** field is not blank; something must be entered.
2. On the **Output** menu, select **Report Format**.
3. On the **Report Format** menu, select **Miscellaneous Data**.
4. Set the **Report Width** field to 80 Columns (the PROVISION default value).
5. On the **Report Format** menu, select **Stream Properties**.
6. Select **Molar Flowrate** and **Weight Fraction**.
7. On the **Report Format** menu select **Unit Operations**.
8. For each column unit operation:

   A On the **Unit Operations** list, select **Column**.

   B Click the **Print Options** button while unit is highlighted.

   C Select **Molar Basis** from the **Column Summary** list.

   D From their respective column print options window, select:

   - Molecular Weights
   - Actual Densities
   - Actual Volumetric Flowrates
   - Transport Properties
   - Flowing Enthalpies
   - Standard Liquid Densities

   E Click **OK**.

F Repeat for each remaining COLUMN unit operation in list.

Note: See the note in the KEYWORD section regarding COLUMN sidestripper's UID's.

9 Click **Close** to finish.

10 Use the default options for remaining unit operations.

Using Keywords

For General Print Options, use the following keywords:

```
Print   INPUT = ALL
        STREAM      = ALL
        RATE  = M
        WIDTH= 80
```

For COLUMN operations, use the following keyword:

Print PROPTABLES = PART or ALL

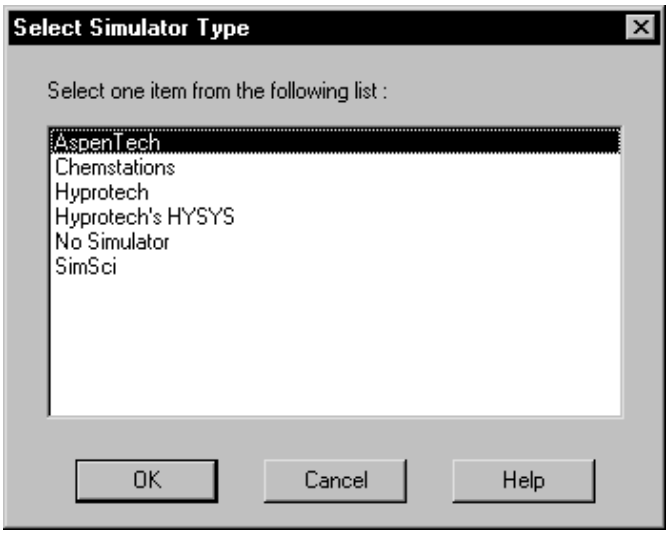
Loading Simulation Data

The following loading procedure translates the specified process simulator report file into IPE.

To load process simulator data:

1 In Project Explorer, **Project Basis** view, right-click **Simulator Type** in the **Process Design** folder; then click **Edit**.

The **Select Simulator Type** dialog box appears.

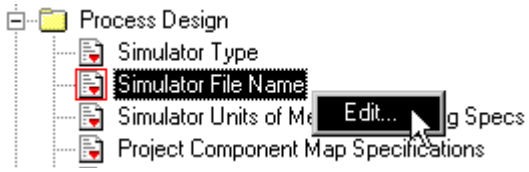


2 Select one type from the list; then click **OK**.

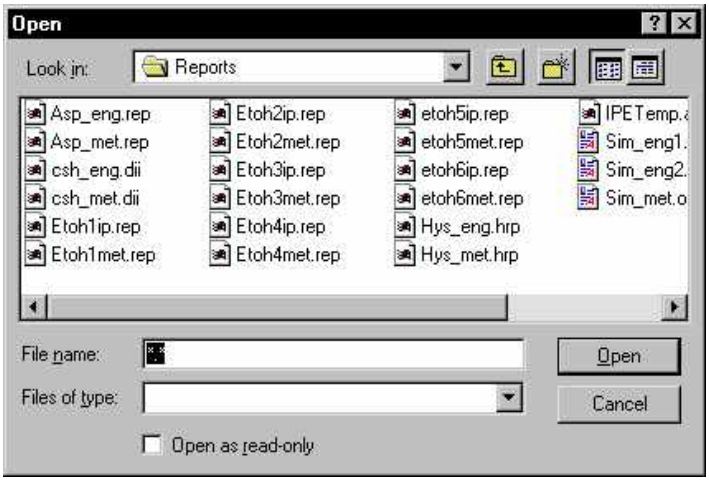
IPE displays a message saying what the new simulator type is.

3 Click **OK**.

4 In the **Process Design** folder, Right-click **Simulator File Name**; then click **Edit**.



The **Open** dialog box appears, showing all simulator files in the Report folder. You can browse other drives and folders as well.



5 Select a file; then click **Open**.

Note: The **List** view now displays the pathname of the selected simulator file when you select **Simulator File Name** in Project Explorer.

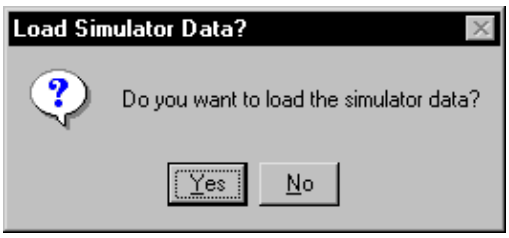
6 Do one of the following:

- Click on the toolbar.

-or-

- On the **Run** menu, click **Load Data**.

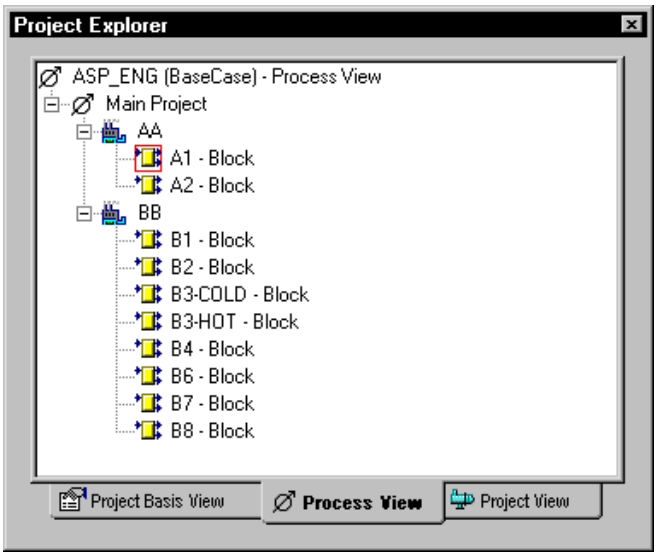
A confirmation window appears.



7 Click **Yes**.

IPE loads the simulator data.

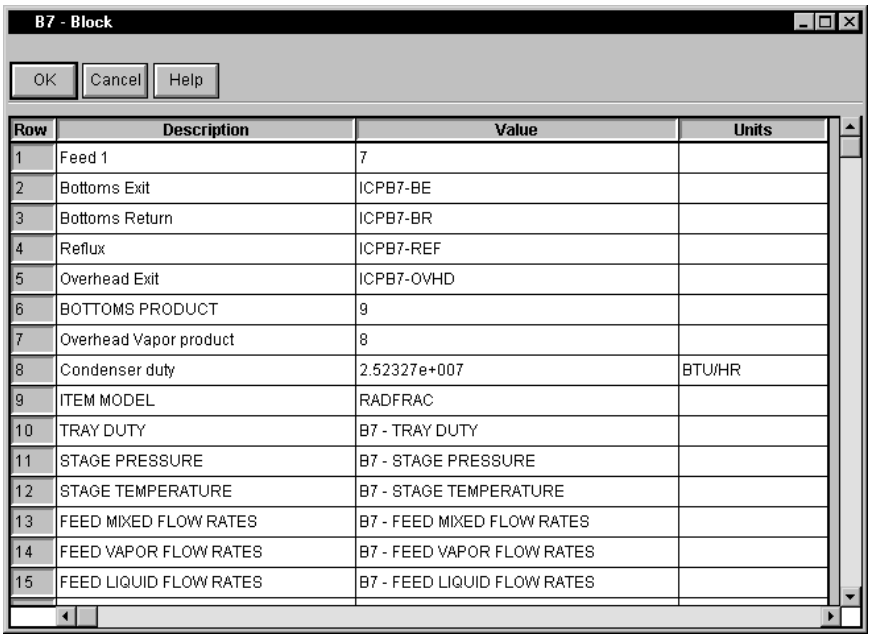
When the loading of the data is finished, the **Process** view of Project Explorer is populated with simulator areas and simulator blocks.



Viewing Data Derived from Simulator

To access simulator-derived data (read-only):

1 Right-click a block, and on the menu that appears, click **Modify**.



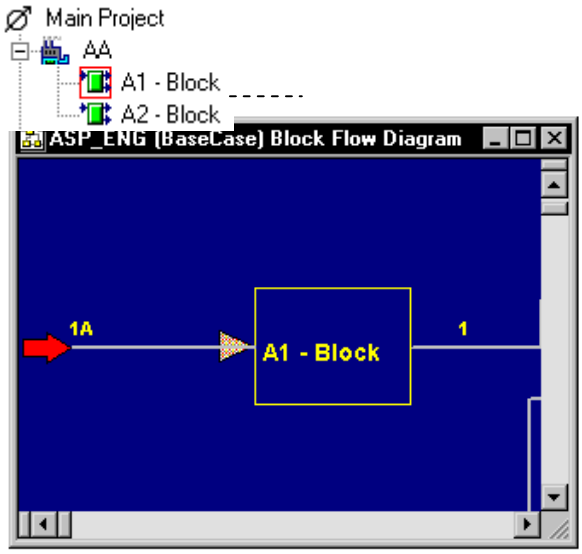
Row	Description	Value	Units
1	Feed 1	7	
2	Bottoms Exit	ICPB7-BE	
3	Bottoms Return	ICPB7-BR	
4	Reflux	ICPB7-REF	
5	Overhead Exit	ICPB7-OVHD	
6	BOTTOMS PRODUCT	9	
7	Overhead Vapor product	8	
8	Condenser duty	2.52327e+007	BTU/HR
9	ITEM MODEL	RADFRAC	
10	TRAY DUTY	B7 - TRAY DUTY	
11	STAGE PRESSURE	B7 - STAGE PRESSURE	
12	STAGE TEMPERATURE	B7 - STAGE TEMPERATURE	
13	FEED MIXED FLOW RATES	B7 - FEED MIXED FLOW RATES	
14	FEED VAPOR FLOW RATES	B7 - FEED VAPOR FLOW RATES	
15	FEED LIQUID FLOW RATES	B7 - FEED LIQUID FLOW RATES	

2 Click **Cancel** to close.

Working with Block Flow Diagrams

IPE automatically generates a Block Flow Diagram (BFD) from a loaded simulator report. Providing a graphical representation of the process, the BFD displays computational blocks and their connections.

The blocks in the diagram correspond to tree items displayed in the Project Explorer's Process view. Color-coding of the blocks in both the Process view and the BFD agree; mapped items are displayed green and unmapped items are displayed yellow.

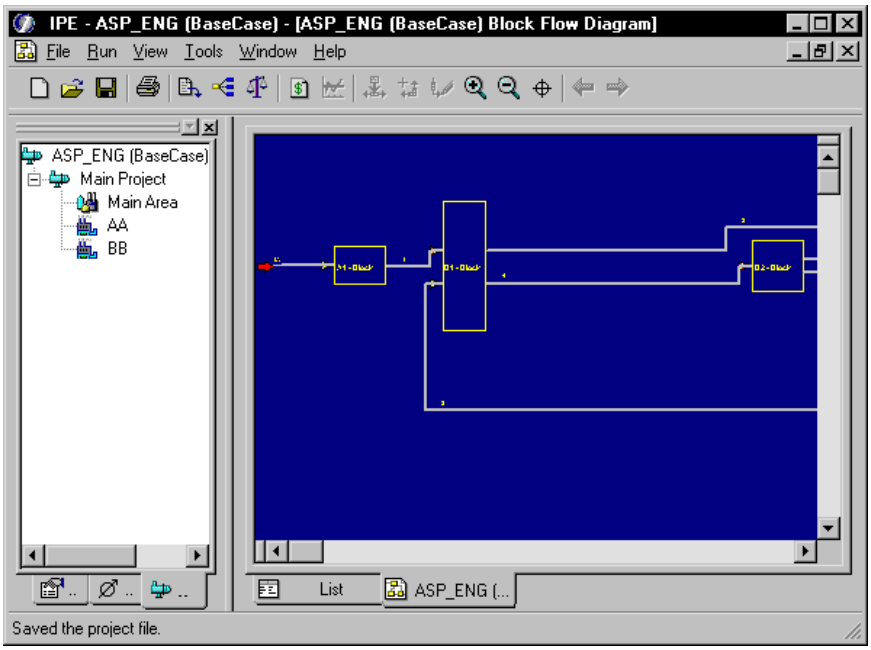


Displaying the Block Flow Diagram

To display the Block Flow Diagram:

- On the **View** menu, click **Block Flow Diagram**.

The BFD appears in the Main Window.



Note: A block can be moved by clicking on the center of the block and dragging it to the desired location. Doing so will also move the streams connected to the block. If the simulator data is reloaded, the block and stream locations will be regenerated by IPE.

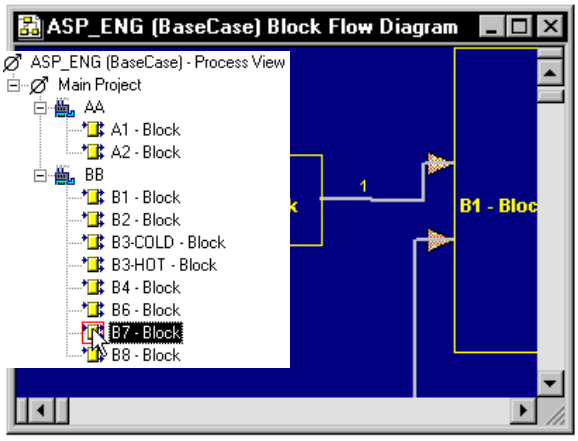
In addition to the blocks displayed in the **Process** view, the BFD displays streams, direction of stream flows, inlets, and outlets.

The commands on the **View** menu change when the BFD is active. (See *Block Flow Diagram View Menu* on page 139 more information.)

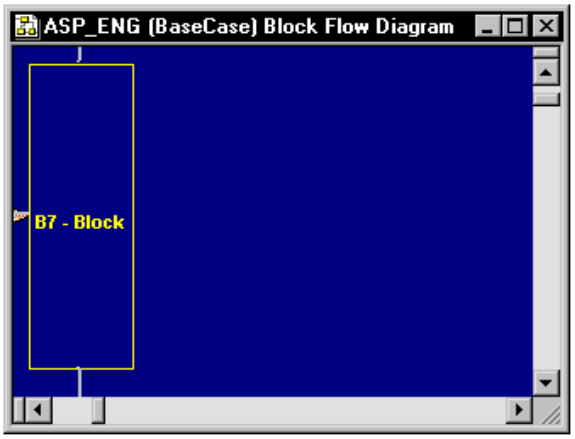
The Drag & Find Feature

There is a quick and easy way to find a block on the BFD.

Drag the block from the Project Explorer's Process view and drop it anywhere in the BFD. The part of the BFD displayed changes so that the block you want to find appears in the upper-left corner of the Main Window.



Drag a block from Project Explorer (Process view) to the BFD

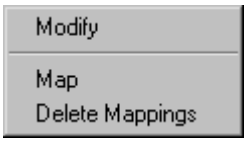


IPE finds the block on the diagram

Accessing Commands in the Block Flow Diagram

Right-clicking on blocks in the BFD accesses the same commands available when you right-click a block in Project Explorer's **Process** view.

Block commands



Clicking **Modify** accesses simulator-derived data (read-only), as shown on page 134.

The **Map** command and **Delete Mappings** command are explained in the next section, *Mapping Simulator Items to Icarus Project Components*, starting on page 141. Alteration of mapping will alter the blocks' color based on its status.

Stream commands

You can double-click a stream to access the Develop Stream specifications form. This form is explained on page 105.

Zooming

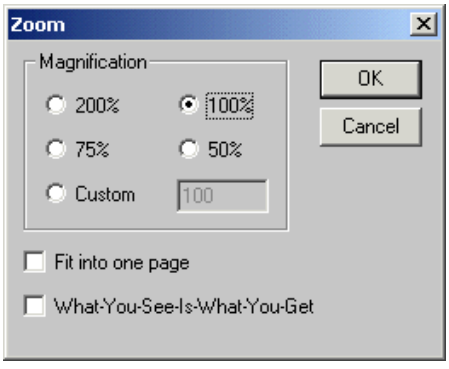
You can use the **Zoom In** and **Zoom Out** buttons to increase or decrease the magnification by degrees:

You can also select an exact magnification by using the Zoom dialog box.

To use the Zoom dialog box:

1 On the **View** menu, click **Zoom**.

The **Zoom** dialog box appears.



2 Click the desired magnification, or click **Custom** and type a percentage between 10 and 1,000.

3 Click **OK** to change magnification and close the dialog box.

-or-

Click **Cancel** to close the dialog box without changing magnification.

The **Zoom** dialog box also has two options that affect printing:

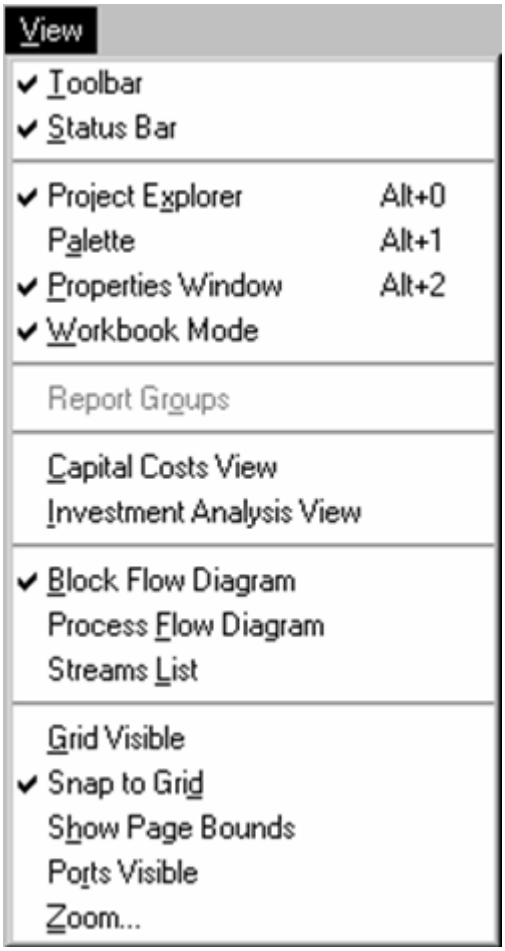
Fit into one page

Mark this box to have IPE re-size the BFD to fit onto one page when printed. This automatically selects the next option, What-You-See-Is-What-You-Get, since the screen image will reflect the size required to fit on one printed page.

What-You-See-Is-What-You-Get (WYSIWYG)

When **WYSIWYG** is cleared, zooming in or out will only affect the magnification factor on the screen, while the printer always prints at 100%. However, if **WYSIWYG** is selected, the magnification factor on the printer will be changed so that the printed image will have the same size as the image appearing on the screen.

Block Flow Diagram View Menu



The View menu contains some options that are only displayed when the Block Flow Diagram is active

Use this	to
Toolbar	View or hide the toolbar. See page 37 for descriptions of toolbar buttons.
Status Bar	View or hide the status bar. See page 24 for description of the status bar.
Project Explorer	View or hide Project Explorer. See page 26 for description of Project Explorer.
Palette	View or hide the Palette. See page 30 for description of the Palette
Properties Window	View or hide the Properties Window. See page 34 for a description of the Properties Window.
Workbook Mode	Turn Workbook Mode on and off. See page 27 for an explanation of Workbook Mode.
Capital Costs View	Launch Aspen Icarus Reporter for interactive reports (on-screen, HTML, or Excel) or Icarus Editor for evaluation reports (**.ccp**). The Project Evaluation needs to have already been run.
Investment Analysis View	Display Investment Analysis spreadsheets. See *Reviewing Investment Analysis* for instructions.
Block Flow Diagram	Display Block Flow Diagram of the loaded simulator data.
Process Flow Diagram	Display Process Flow Diagram. This command is not active until you have mapped the simulator items.
Streams List	Display a read-only list of all simulator-derived stream properties in a spreadsheet. You can customize some of the features of the spreadsheet (which stream properties to display, whether to display names of the properties, and the display style of the property values) by editing the stream list template file: ...\Economic Evaluation V7.3\Data\ICS\strlist.fil
Grid Visible	View or hide grid lines.
Snap to Grid	Move blocks in increments corresponding to the grid lines when dragging to new location.
Show Page Bounds	View or hide page separation lines. When displayed, you can see where page breaks will be when printing.
Ports Visible	View or hide ports in the Process Flow Diagram. Does not apply to Block Flow Diagram.
Zoom	Access **Zoom** dialog box. See page 138.

Mapping Simulator Items to Icarus Project Components

Mapping is the process of converting each simulator block (that is, model or unit operation) into one or more Icarus project components.

To map simulator items:

1 If you want to map all items, access the **Map** dialog box by doing one of the following:

- Click on the toolbar.

-or-

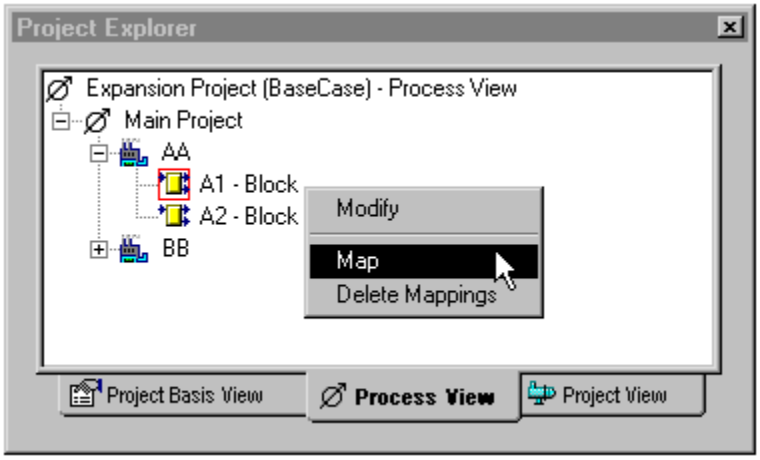
- On the **Run** menu, click **Map Items**.

2 If you want to map a single block or all blocks in an area, do one of the following:

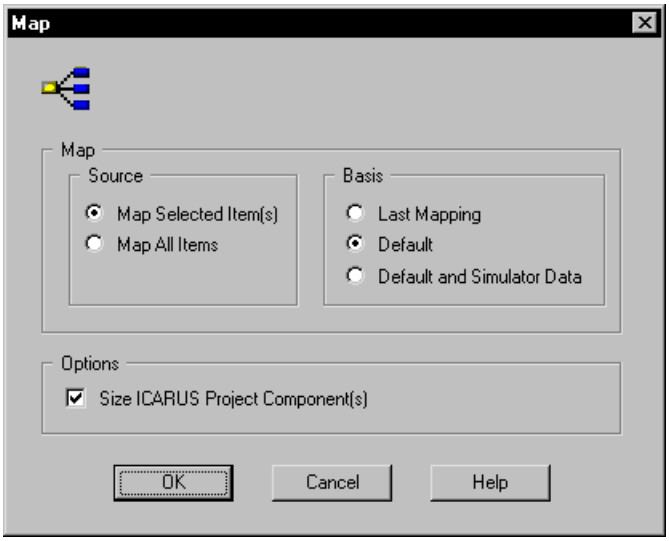
- In **Process** view, right-click a block or area; then click **Map** on the menu that appears.

-or-

- In the Block Flow Diagram, right-click a block then click **Map** on the menu that appears.



The **Map** dialog box appears.



Note: If you clicked the **Map** button on the toolbar or clicked **Map Items** on the **Run** menu, only the **Map All Items** check box is available in the **Source** section.
If you clicked **Map** on a pop-up menu, both **Map Selected Item(s)** – the default choice – and **Map All Items** are available.

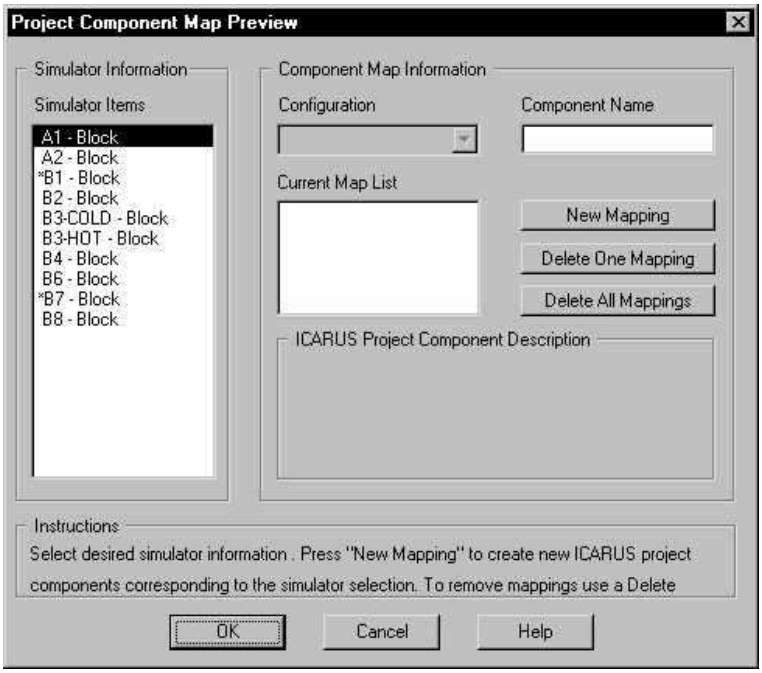
Select the desired mapping options.

Option	Description
Source	
Map Selected Item(s)	Map the selected simulator block or the simulator blocks in the selected simulator area. This option is available only if you selected Map from a pop-up menu.
Map All Items	Map all simulator items in the project.
Basis	
Last Mapping	Map a block according to the last time it was mapped. This option retains only the type of Icarus project component(s) to which the block was last mapped.
Default	Use the **Component Map Specs** file for the basis.
Default and Simulator Data	Use the Component Map Specs file for the basis, but override the mapping using specific data in the simulator. For example, if you select this option and a reboiler type is specified in the simulator report, an equivalent reboiler type will be used in the mapping. Further, if the "Preferences>Process>Use Automatic Mapping Selection when Available" was selected, then additional engineering rules of thumb will be used for a selected category of equipments (for example, pumps, compressors, and heat exchangers) to come up the mapping recommendations. (Note: Currently this mode is active only when blocks are mapped one at a time.) Users are encouraged to review these recommendations

Option	Description
	and either accept them or select a different equipment type based on their knowledge of their processes and practices.
Options	
Size Icarus Project Component(s)	Size the mapped Icarus project component(s). If you are mapping a single item to a single component that can be sized using the interactive Sizing Expert, the Interactive Sizing form will appear after mapping. Otherwise, IPE uses its automatic sizing. Although the Sizing Expert is unavailable when sizing multiple components, you can still use it later (assuming the component is one of those that can be sized interactively). Just right-click on the mapped component and click Re-Size on the pop-up menu. **Note:** See Chapter 6 for instructions on using the Sizing Expert.

3 Click **OK**.

The **Project Component Map Preview** dialog box appears.

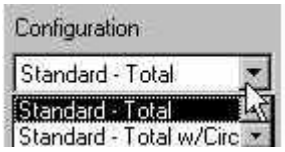


Note: All simulator items are displayed because **Map all Items** was selected at the previous dialog box. Those components being mapped have asterisks next to them.

If you selected **Map Selected Item(s)** on the **Map** dialog box, the **Simulator Items** list displays just the selected simulator block(s). If you selected **Map all Items**, the **Simulator Items** list displays all simulator blocks.

The **Current Map List** displays any components that are already mapped to the simulator block highlighted on the Simulation List.

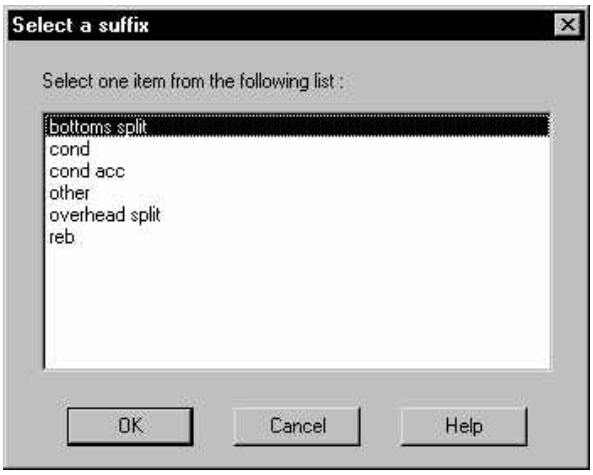
The **Configuration** option box is active only for blocks representing column models. (In the sample project, Block B7 represents a column model.)



You must use the arrow scroll buttons to see all ten possible configurations. Selecting a configuration type automatically fills in the **Current Map List** with the components required for that configuration type. See *Tower Configurations* on page 150 for more information.

4 Click **New Mapping** to map a block highlighted on the **Simulator Items** list to an Icarus project component.

If the simulator block represents a column model that does not yet have all its required mappings, the **Select a Suffix** dialog box appears, listing the types of components (indicated by suffixes that appear at the end of Item Descriptions on the List view) that still need to be mapped to the block.



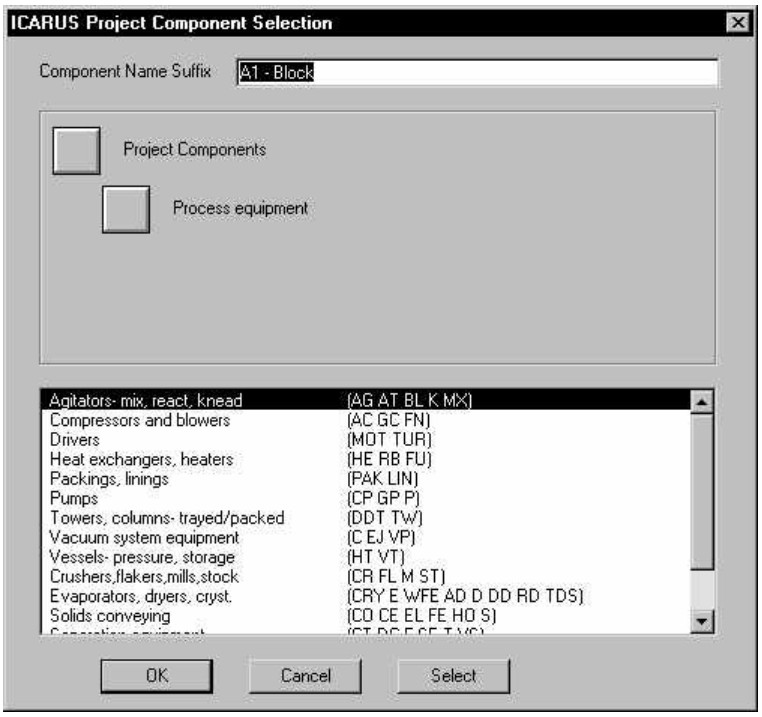
Note: See Tower Configurations on page 150 for more information.

Suffix	To indicate
bottoms split	bottoms splitter
bot exchanger	bottoms exchanger
bottoms pump	bottoms pump
Cond	condenser for the tower
cond acc	condenser accumulator
ovhd exchanger	Overhead exchanger
Overhead split	Overhead splitter
ovhd pump	Overhead pump
precooler	first heat exchanger in “split” configuration”
Reb	reboiler for the tower

Suffix	To indicate
reflux pump	reflux pump
Tower	main tower
Trim	second heat exchanger in “split” configuration”
Other	user-selectable.
spray cond	Spray condenser
spray cond exit pump	Pump for recirculating the spray condenser exit
sc tot recycle splitter	Splitter in Spray Condenser Configuration that generates the *total recycle stream*
sc cooler	Heat exchanger in the Spray Condenser Configuration that cools the entire *total recycle stream*
sc tot recycle trim splitter	Trim splitter in Spray Condenser Configuration 2
sc trim	Heat exchanger in the Spray Condenser Configuration that cools the entire total recycle stream

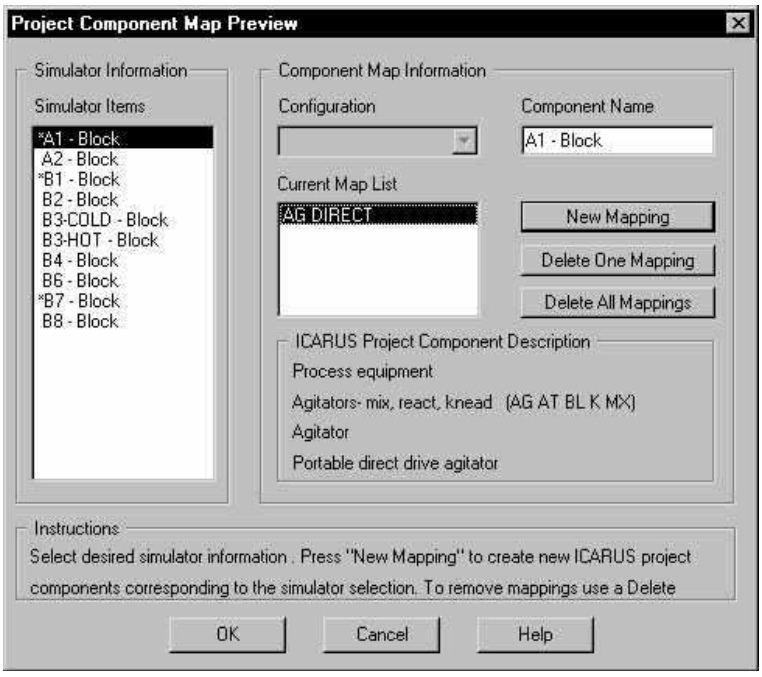
5 Select a suffix; then click **OK**.

The **Icarus Project Component Selection** dialog box appears.


ICARUS Project Component Selection
Component Name Suffix
A1 - Block
Project Components
Process equipment
Agitators- mix, react, knead (AG AT BL K MX)
Compressors and blowers (AC GC FN)
Drivers (MOT TUR)
Heat exchangers, heaters (HE RB FU)
Packings, linings (PAK LIN)
Pumps (CP GP P)
Towers, columns- trayed/packed (DDT TW)
Vacuum system equipment (C EJ VP)
Vessels- pressure, storage (HT VT)
Crushers,flakers,mills,stock (CR FL M ST)
Evaporators, dryers, cryst. (CRY E WFE AD D DD RD TDS)
Solids conveying (CO CE EL FE HO S)
OK
Cancel
Select

6 Select a component.

The **Project Component Map Preview** dialog box now displays the component category's item symbol (for example, **AG**) and the component type (for example, **DIRECT**) in the **Current Map List**. More component details are displayed in the **Icarus Project Component Description** section.



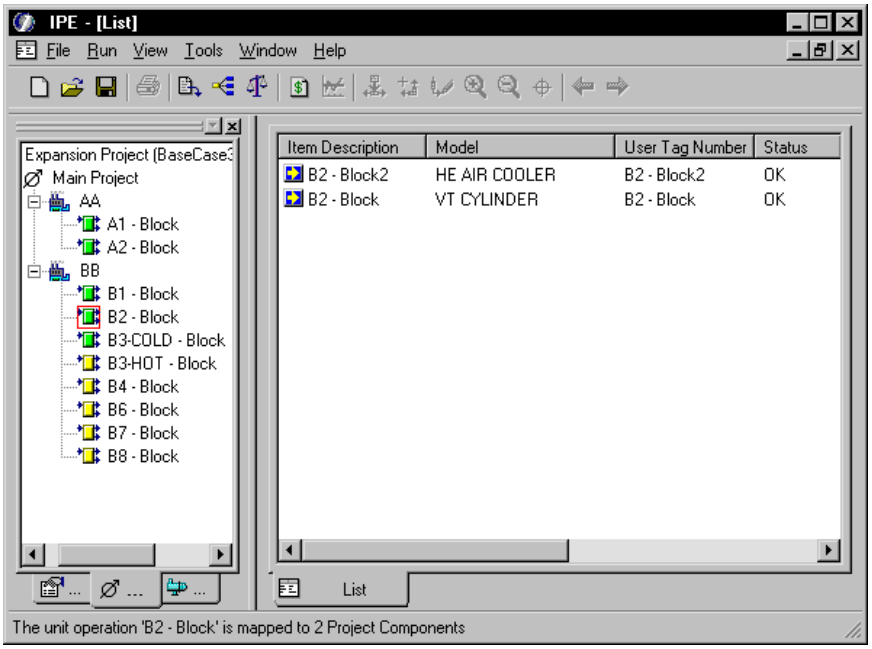
By default, the **Component Name** field contains the block name. You may want to modify it to be more descriptive and to distinguish the component from others to which the block has also been mapped. This can be as simple as adding a descriptor at the end.

Each component mapped from the block must have a unique name; if another component already has the default component name, IPE prompts you to enter a unique name after you select another component.

7 Click **OK** to complete the mapping.

If you selected to size the mapped component(s), IPE also performs automatic sizing or, in cases in which a single item is being mapped to a single component for which interactive sizing is available, the Interactive Sizing form appears. See Chapter 6, *Sizing Project Components*, for information on this feature.

With the block now mapped, the **List** view displays the components mapped from the simulator block.



Component Status

You may notice a "?" in the Status column of a project component mapped from the simulator block. This indicates that there are still specifications that need to be entered for the component. To enter the specifications, right-click on the component and click Modify Item on the pop-up menu. Entering specifications in the required fields will change the status to OK. Required fields are indicated by color-coding explained, under *Entering Component Specifications*.

If you do not enter the specifications and the "?" remains in the Status column, the item will not be included in the project evaluation and will have "0" cost associated with it. It will not cause SCAN messages.

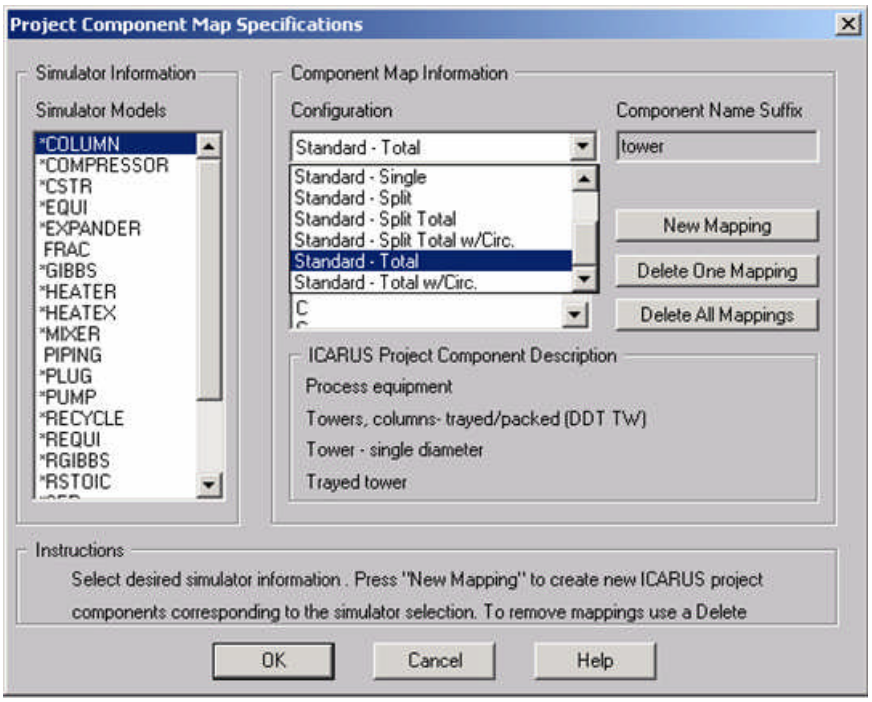
Deleting Mappings

To delete mappings:

- Right-click in the simulator area or simulator block in **Process** view; then, on the menu that appears, click **Delete**.

Tower Configurations

Because a column can be mapped to multiple pieces of equipment, IPE requires that you select a tower configuration on the **Project Component Map Preview** dialog box.



You can select from among ten possible configurations:

- Standard – Single
- Standard – Total
- Standard – Total w/Circ.
- Standard – Split
- Standard – Split Total
- Standard – Split Total w/Circ.
- Full – Single
- Full – Single w.Circ.
- Full – Split
- Full – Split w/Circ.

This term	means
Single	Tower has one condenser.
Split	Tower has multiple condensers.
Total	the reflux pump handles the total outlet liquid flow from the accumulator. In such configurations, the splitting into a reflux and overhead liquid product occurs after the reflux pump.
Circ.	there is a pump between the bottoms splitter and the reboiler giving a forced circulation configuration around the reboiler.

Note: Full configurations include the following equipment not found in **Standard** configurations:

- overhead pump

- overhead product heat exchanger
- bottoms product pump
- bottoms product heat exchanger

Based on the tower configuration selected, IPE automatically creates a model for each tower block and then maps the model to an Icarus project component. In addition, you can specify how the condenser requirements should be split between the **Precooler** and the **Trim** cooler on the **Design Criteria** specifications form.

If subcooling is present, the precooler will completely condense the overhead vapor and the trim cooler will perform the subcooling; the split specification on the **Design Criteria specifications** form will be ignored when subcooling is present.

The following figures display the ten possible configurations. The default item description suffixes (see page 144) are used to identify the configuration parts, each of which is mapped to an Icarus project component.

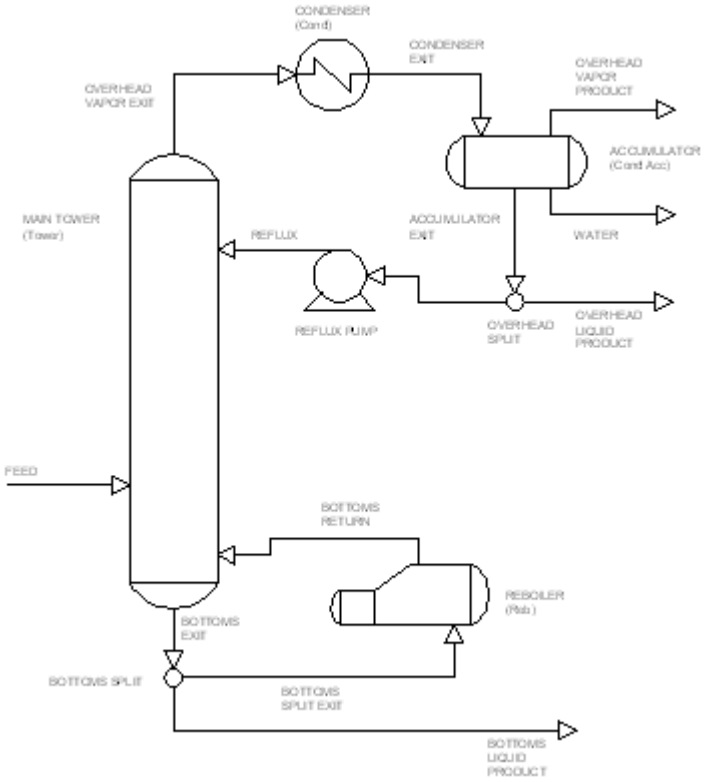


Figure 1: Standard – Single

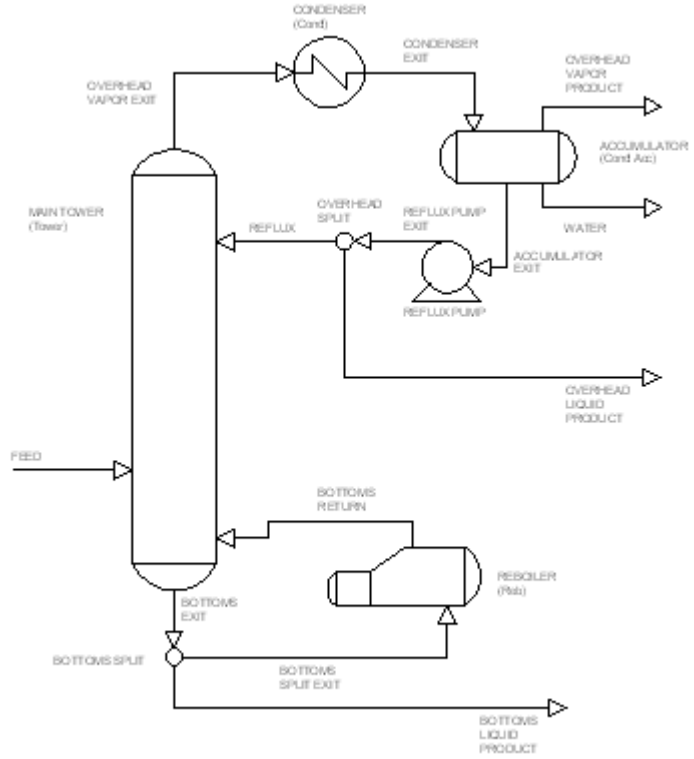


Figure 2: Standard Total

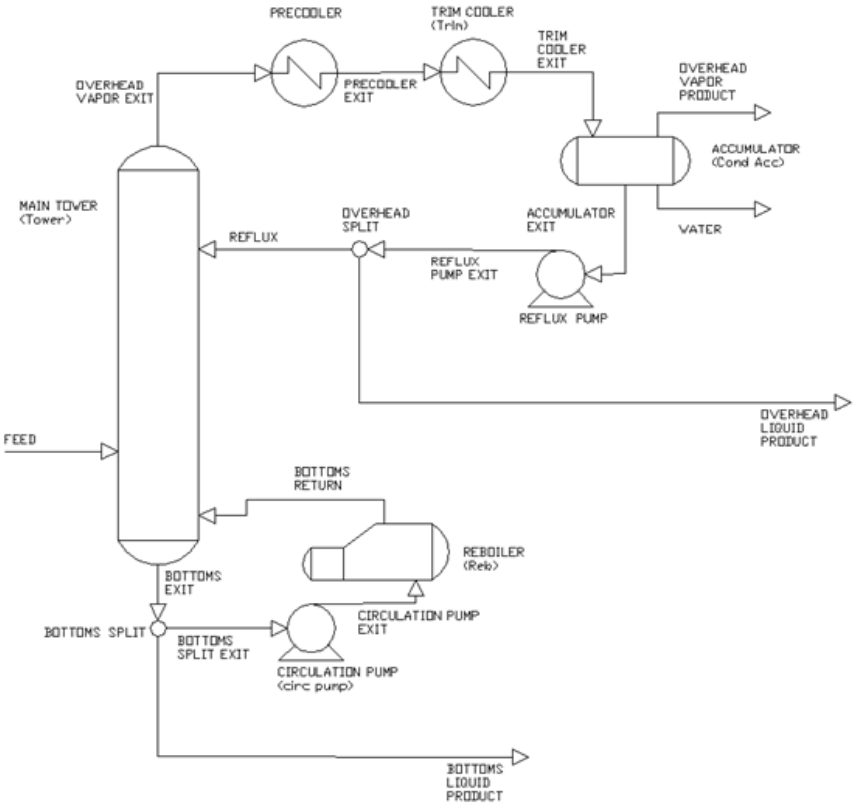


Figure 3: Standard Total w/Circ

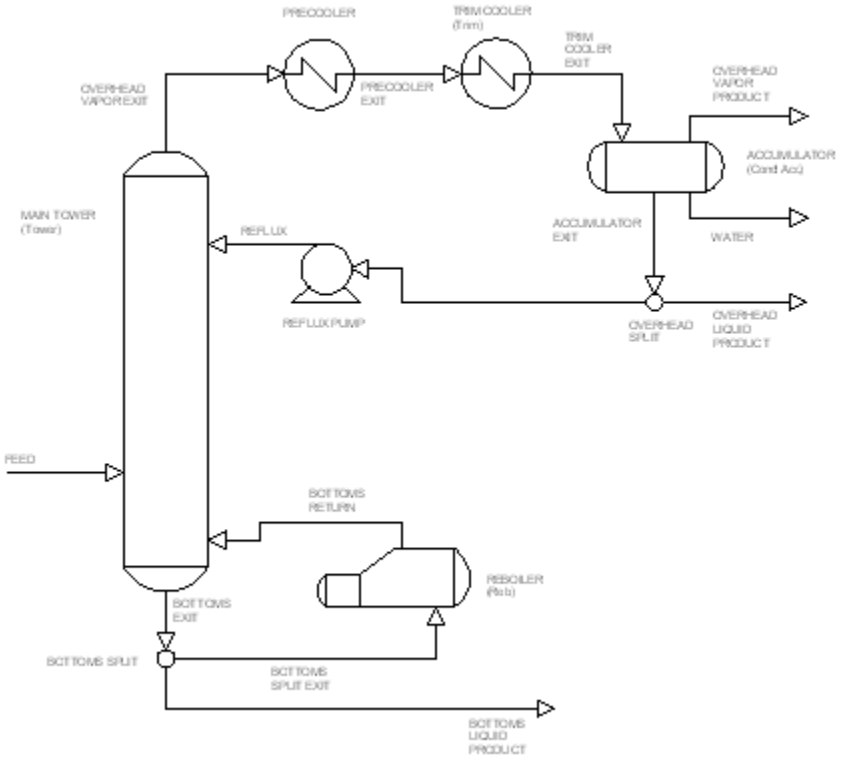


Figure 4: Standard Split

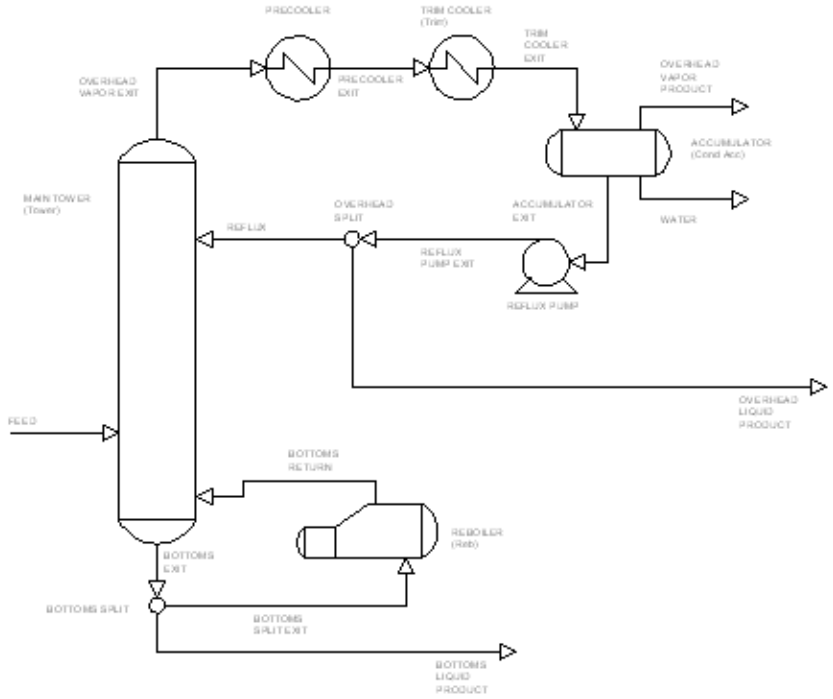


Figure 5: Standard Split Total

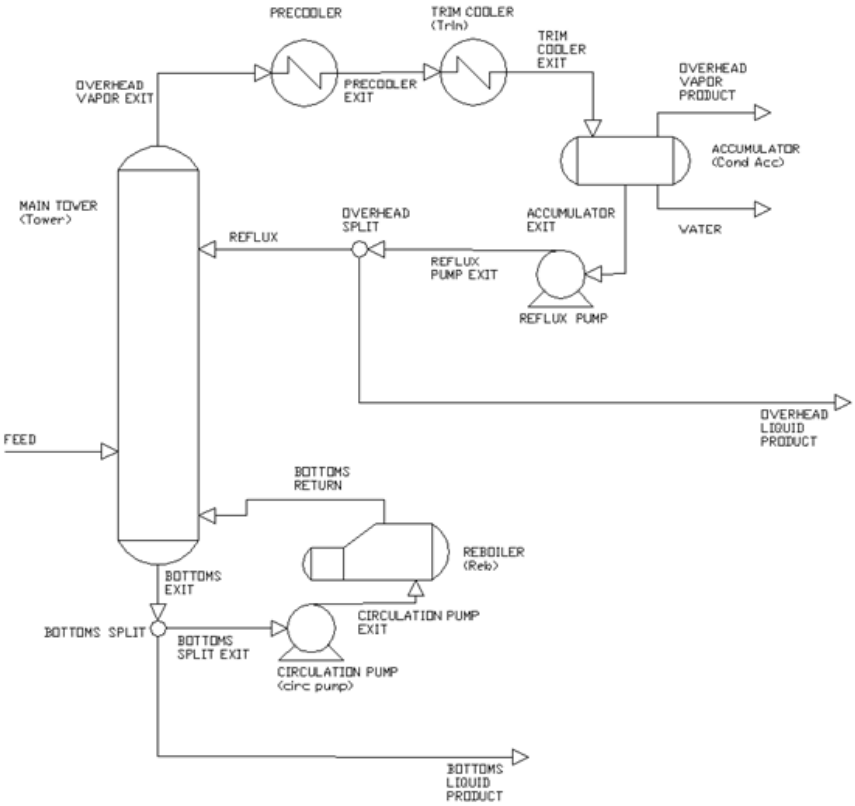


Figure 6: Standard Split Total w/Circ.

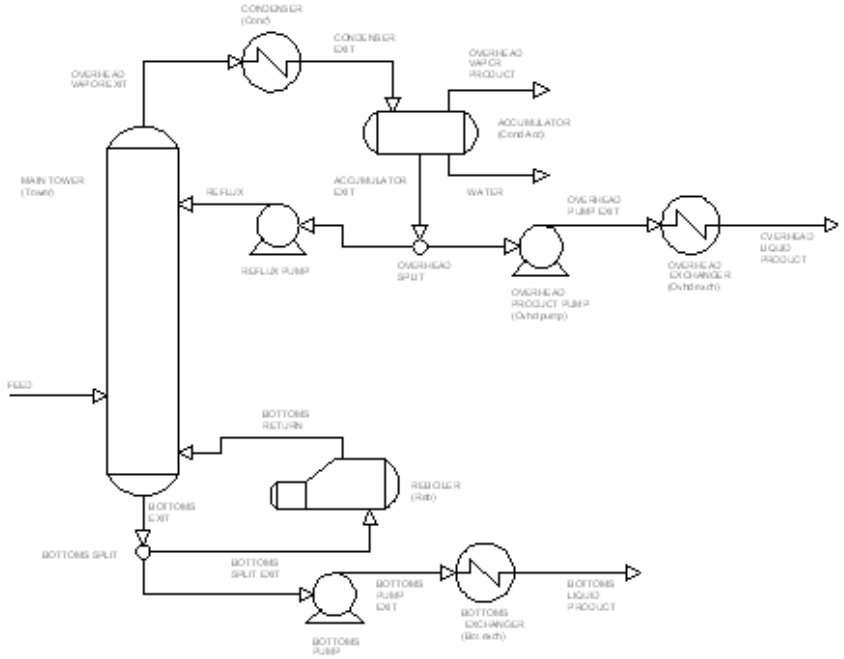


Figure 7: Full – Single

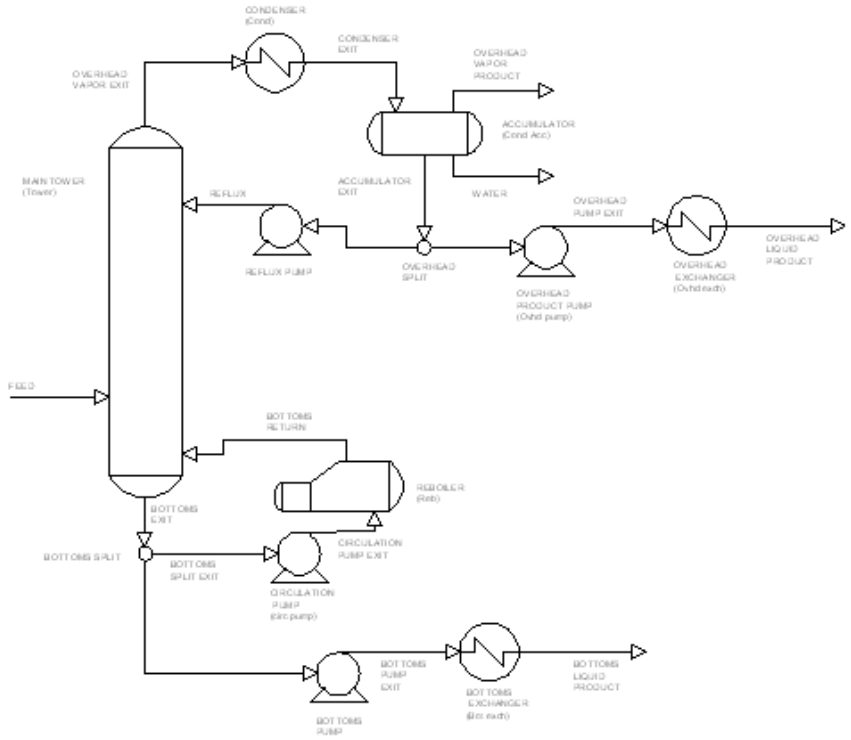


Figure 8: Full – Single w/Circ.

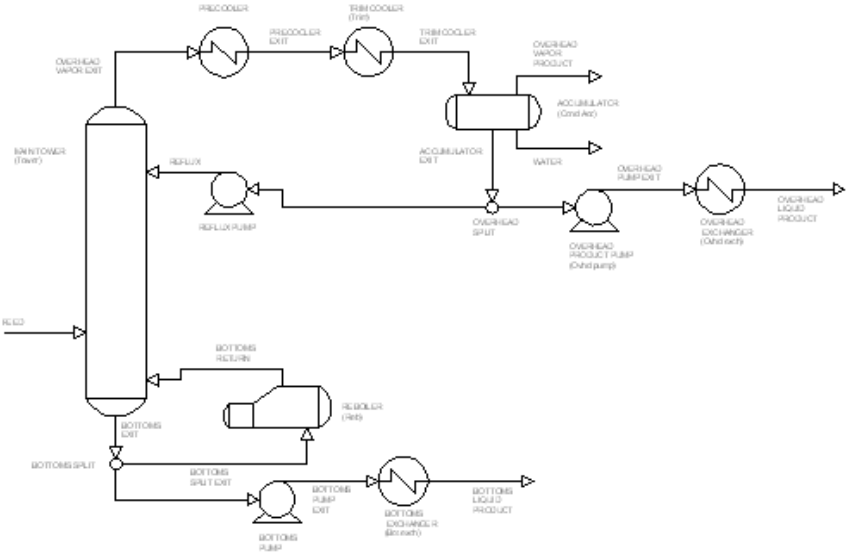


Figure 9: Full – Split

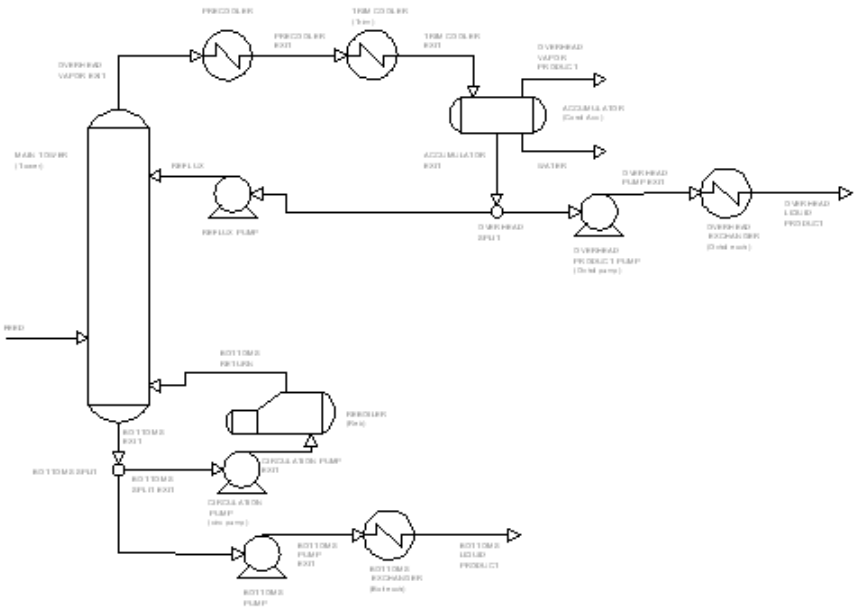


Figure 10: Full – Split w/Circ.

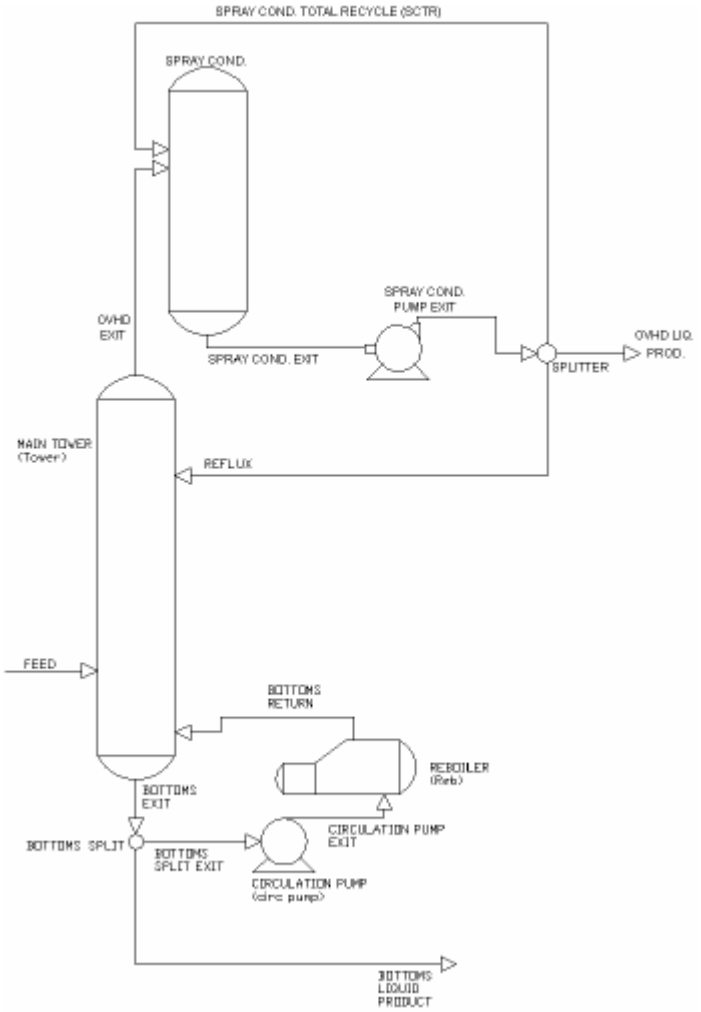


Figure 11: Spray Condenser Configuration 1 w/Circ.

Note: Flow rate of the Spray Cond Total Recycle (SCTR) stream is calculated using Ratio of Recycle to (Ovhdliqprod + Reflux) Flowrates = mSCTR / (mOVH LIQ PROD+ mREFLUX). Ratio of Recycle to (Ovhdliqprod + Reflux) Flowrates is an input specified in the Design Criteria.

mSCTR = mass flow rate of the SCTR stream.

mOVH LIQ PROD = mass flow rate of the Overhead Liquid Product stream.

mREFLUX = mass flow rate of the Reflux stream.

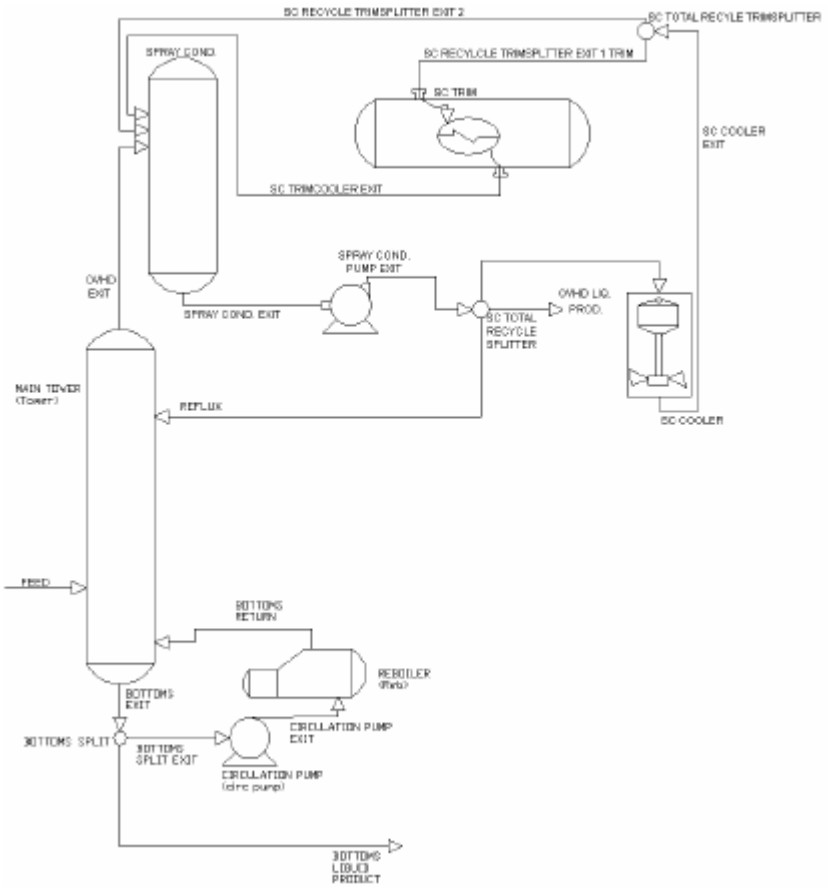


Figure 12: Spray Condenser Configuration 2 w/Circ.

The duty for the **SC COOLER** and **SC TRIM** exchangers are calculated using

Ratio of SC Trim Duty to Overall Duty = $Q_{SCTRIM} / Q_{CONDENSER}$

$Q_{CONDENSER} = Q_{SCTRIM} + Q_{SCCOOLER}$

where:

Ratio of SC Trim Duty to Overall Duty is an input specified in the Design Criteria

Q_{SCTRIM}	=	**Spray Condenser** Cooler Duty
$Q_{SCCOOLER}$	=	**Spray Condenser Trim** Duty
$Q_{CONDENSER}$	=	**Total Overhead Condenser** Duty, obtained from Simulator Data

Then the temperatures of the streams exiting the Spray Condenser Cooler and Spray Condenser Trim exchangers are calculated using:

a **Q = mCpDeltaT** calculation.

Flow rate of the streams exiting the ***SC Tot Recycle Trim*** Splitter are determined using:

SC Trim Splitter Flow Split Ratio = $m_{SCRTSEx1} / m_{SCCEx}$

$m_{SCCEx} = (m_{SCRTSEx1} + m_{SCRTSEx2})$

SC Trim Splitter Flow Split Ratio is an input specified in the Design Criteria

m_{SCCE} = mass flow rate of the **SC Cooler Exit** Stream

$m_{SCRTSEx1}$ = mass flow rate of the **SC Rcy Trim Splitter Ex1** Stream

(this is the one that subsequently goes through the SC TRIM exchanger)

$m_{SCRTSEx2}$ = mass flow rate of the **SC Rcy Trim Splitter Ex2** Stream

Sizing Selection

This section outlines the workflow of the sizing selection feature available in Aspen Icarus Process Evaluator. Sizing selection is a mechanism that lets you pre-define and/or define sizing rules for project components. Specifically, you can set rules on equipment models or specific project components to be sized with one or more custom models.

Project Sizing Selection

Typically, you load data from a simulation and then choose to map the simulator unit operations. In the mapping screen that appears, there is a check box to **Review Sizing Selection**. If selected (the default is based on the **Tools | Options | Preferences | Process | Sizing selection** on the **item-size** menu), the sizing selection appears.

You select any custom model for sizing the project components listed.

- If an item is selected, the sizing preview screen appears during a **size** or **re-size** performed on one or more project component(s).
- If an item is not selected, the mapping preview screen does not appear for editing during these steps, but the sizing selection specifications is applied to the selected project component(s).

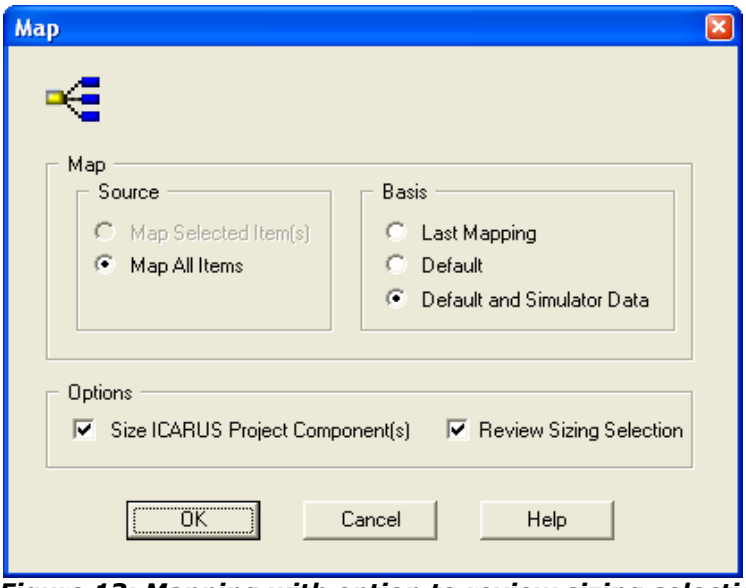


Figure 13: Mapping with option to review sizing selection

If selected, you will see the **Sizing Selection** preview after the mapping preview screen for a chance to edit how the project components are sized (see Figure 14).

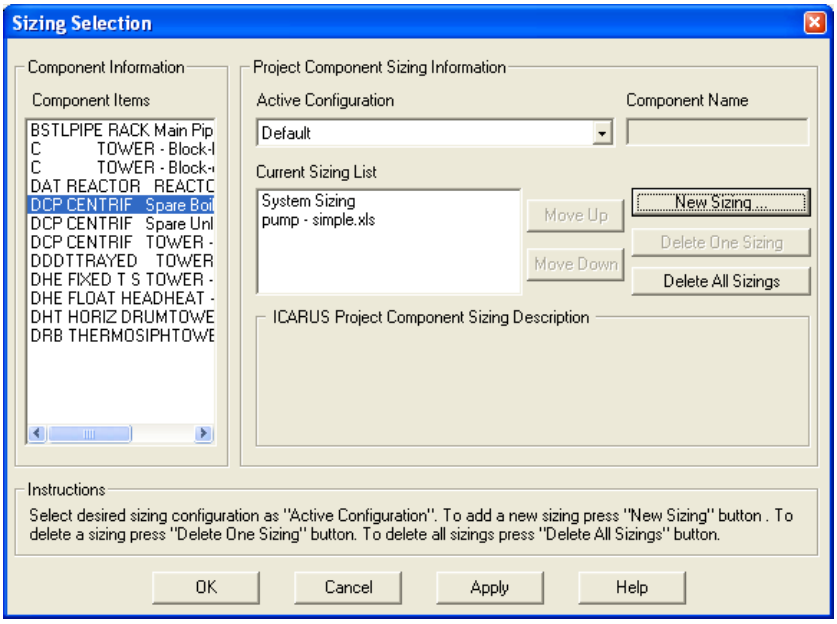


Figure 14: Sizing Selection preview for specified project components

You can specify the sizing routines (System Sizing and custom models) for each project component (created by mapping from a simulator or manual creation) that will be applied during the **size-all** step.

If a custom model is specified in the current sizing list for a project component, the project component will be sized in the order shown in the Current Sizing List (see Figure 14). Any custom models listed will be sized using the custom model tool automatically without any user-interaction required. After sizing is complete, the system returns to a ready-state for you to perform additional project tasks.

Specifying Additional Components

Icarus project components can be added to areas mapped from a simulator report. However, these project components must initially be added in a user-added area. You can later rearrange the components in Project Explorer's Project view, drag components from a user-added area to an area mapped from the simulator report.

Follow the instructions for adding a project component on page 172.

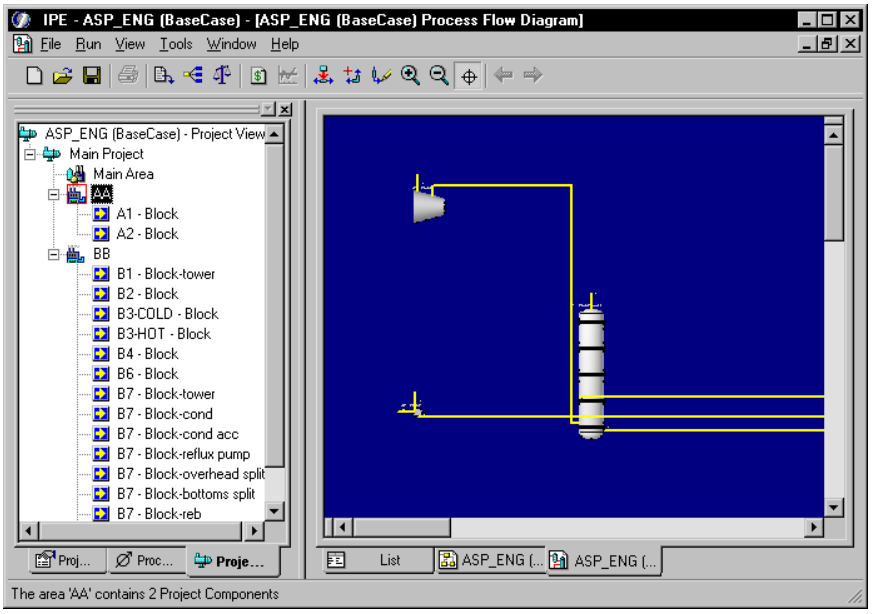
If the component you add is process equipment, IPE adds an icon representing the new equipment item in the upper left-hand corner of the Process Flow Diagram (PFD). The next section, *Working with Process Flow Diagrams*, includes instructions (under "Editing Connectivity" on page 164) for connecting an added component to a stream in **PFD** view.

Working with Process Flow Diagrams

Process Flow Diagrams (PFD) provide graphical representations of Icarus process equipment mapped from simulator blocks and the interconnecting streams. You can edit the layout and connectivity of the mapped items from PFD view. You can also add streams. IPE provides intelligent port selection, so that when drawing a stream you see the candidate ports highlighted in green as the mouse is moved over them.

To access PFD view:

1 On the **View** menu, click **Process Flow Diagram**.



2 Use the **Drag-and-Find** feature to locate any equipment item on the PFD.

3 Drag an equipment item from Project Explorer (**Project** view) and drop it on the PFD.

The icon in the PFD that corresponds to the selected equipment will be positioned in the upper left-hand corner (regardless of magnification).

Editing the Layout

To change the position of an item:

- Use your mouse to drag the item to its new position.

IPE reroutes any streams connected to the item.

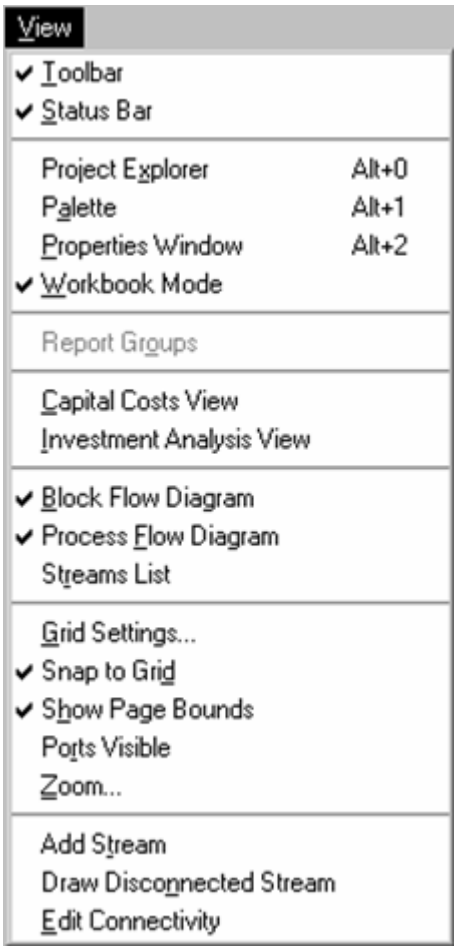
To change the route of a stream:

- Click the stream; then drag the stream to straighten it or to create an elbow-bend.

Note: If you eventually select **Reroute All Streams** on the **Run** menu, IPE chooses the most logical routes for all streams.

Process Flow Diagram View Menu

Note: The **View** menu contains some options that are displayed only when the Block Flow Diagram is active.



Use this	to
Toolbar	View or hide the toolbar. See page 37 for descriptions of toolbar buttons.
Status Bar	View or hide the status bar. See page 24 for a description of the status bar.
Project Explorer	View or hide Project Explorer. See page 26 for a description of Project Explorer.
Palette	View or hide the Palette. See page 30 for a description of the Palette.
Properties Window	View or hide the **Properties** window. See page 34 for a description of the **Properties** window.
Workbook Mode	Turn **Workbook Mode** on and off. See page 27 for an explanation of Workbook Mode.
Capital Costs View	Launch Aspen Icarus Reporter for

	interactive reports (on-screen, HTML, or Excel) or Icarus Editor for evaluation reports (**.ccp**). The Project Evaluation needs to have already been run.
Investment Analysis View	Display **Investment Analysis** spreadsheets.
Block Flow Diagram	Display **Block Flow Diagram** of the loaded simulator data.
Process Flow Diagram	Display **Process Flow Diagram.** This command is not active until you have mapped the simulator items.
Streams List	Display a read-only list of all simulator-derived stream properties in a spreadsheet. You can customize some of the features of the spreadsheet (which stream properties to display, whether to display names of the properties, and the display style of the property values) by editing the stream list template file: ...\Economic Evaluation V7.3\Data\ICS\strlist.fil
Grid Settings	Access **Grid Properties** dialog box, where you can set the grid increments and select to view or hide grid lines.
Snap to Grid	Move blocks in increments corresponding to the grid lines when dragging to new location.
Show Page Bounds	View or hide page separation lines. When displayed, you can see where page breaks will be when printing.
Ports Visible	View or hide ports.
Zoom	Access **Zoom** tool. This is the same as in the **Block Flow Diagram** (see page 138).
Add Stream	Access the **Develop Streams** dialog box. See **Adding A Stream**, page 166, for details.
Draw Disconnected Stream	Access the Disconnected Streams dialog box. See "Drawing a Disconnected Stream," page 168, for details.
Edit Connectivity	Activate the Edit Connectivity feature. See "Editing Connectivity," page 164, for details.

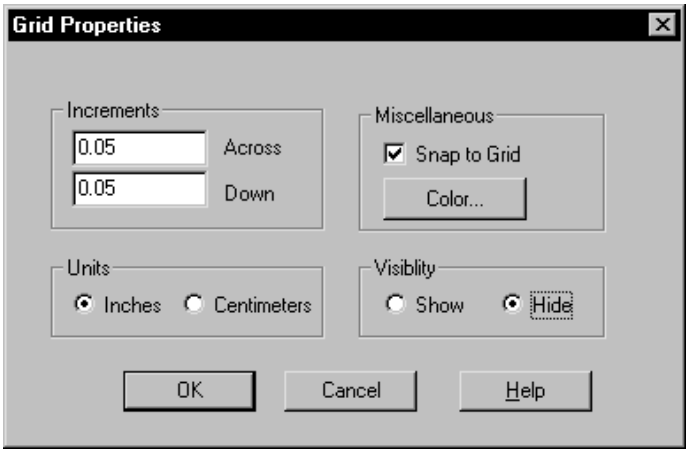
Setting Grid Properties

You can select to display grids of any increments. In addition, you can select the color of the grids and whether to be in **Snap to Grid** mode.

To set grid properties:

1 On the **View** menu, click **Grid Settings**.

The **Grid Properties** dialog box appears.



2 Set the **Across** and **Down** grid increments in the **Increments** section. Specify in the **Units** section whether the specified increments are in inches or centimeters.

3 Select the **Snap to Grid** check box to turn on **Snap to Grid** mode. When you drag a block in this mode, the block's bounding outline moves in increments corresponding to the grid.

4 Click **Color** to select a grid color.

5 Finally, in the **Visibility** section, click whether to show or hide the grid.

6 Click **OK** to apply the settings.

Editing Connectivity

The Edit Connectivity feature lets you make changes to the layout of items in the PFD. Because this involves connecting and disconnecting streams to ports, the **Ports Visible** option should be on, as it is by default.

If the ports are not visible, click the **Ports Visible** button .

Connecting a Stream to Different Inlet Port
To connect a stream to a different inlet port:

1 Do one of the following:

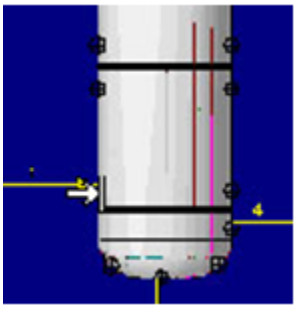
- On the toolbar, click the **Edit Connectivity** button

-or-

- On the **View** menu, click **Edit Connectivity**.

2 Place the cursor over the end of the stream you want to connect to a different inlet port.

The cursor becomes an arrow.

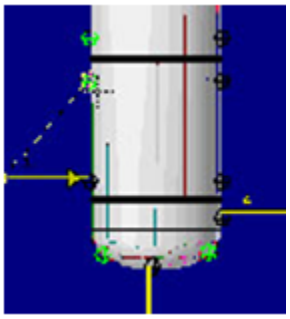


3 Click the end of the stream.

The cursor now appears as a crosshairs.

4 Move the cursor to another inlet port.

When the cursor is in close proximity to a component, the component's available inlet ports display green.



5 Click the new inlet port.

Connecting an Added Project Component to a Stream

Project components that you add to the project appear in the upper left-hand corner of the PFD and are not connected to any streams.

To connect an added project component to a stream:

1 Do one of the following:

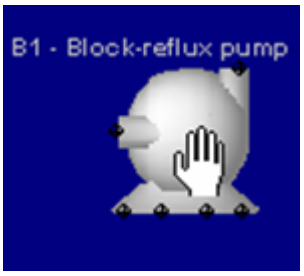
- On the toolbar, click the **Edit Connectivity** button

-or-

- On the **View** menu, click **Edit Connectivity**.

2 Place the cursor over the added project component that you wish to insert into an existing stream.

The cursor becomes a hand.



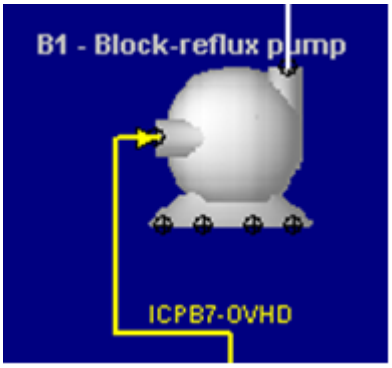
3 Click the component.

A bounding outline, representing the component, appears around the cursor.

4 Move the cursor over a stream. Click when you have placed the cursor over the desired stream.

IPE disconnects the **Sink** end of the stream from the inlet port on the current component, then automatically re-connects it to the inlet port on the inserted component.

IPE also creates a new stream, which appears white and has properties relative to the initial stream. IPE connects the **Source** end of this new stream to the outlet port of the inserted item and the Sink and to the inlet port of the original.



The added item can now be sized manually or using the **Size Item** option, which either automatically sizes the item or, if interactive sizing is available, accesses the Sizing Expert. The Sizing Expert, explained in Chapter 6, will utilize the newly connected streams.

Adding a Stream

From PFD view, you can create a new stream and specify its connectivity. The process of developing streams is explained in detail under *Developing Streams*, page 103.

To add a stream:

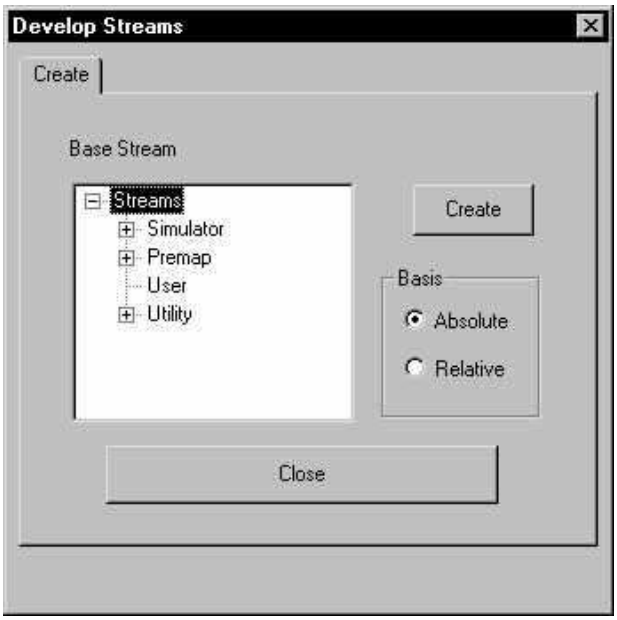
1 Do one of the following:

- On the toolbar, click the **Add Stream** button .

-or-

- On the **View** menu, click **Add Stream**.

The **Develop Streams** dialog box appears.



2 Do one of the following:

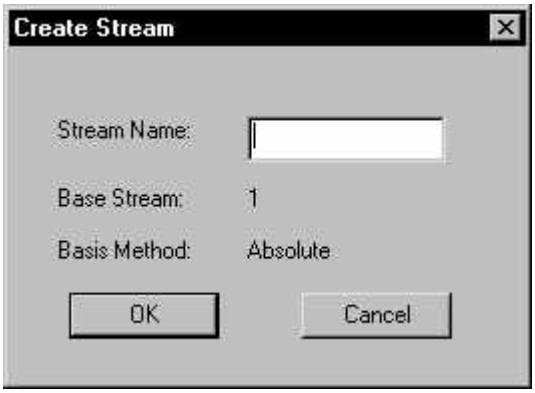
- To create a stream from scratch, click **Create** and proceed to Step 3.

  -or-

- To create a stream based on an existing stream, in the Base Stream section, click the existing stream; **and** then click a Basis:
  - **Absolute** If the **Basis Mode** is **Absolute**, the data from the base stream is copied to the new stream at the time the new stream is created. If the data of the base stream is altered at any time after this point, the data of the new stream remains unchanged.
  - **Relative** If the **Basis Mode** is **Relative**, the new stream's data is dynamically linked to that of the stream on which it's based. This means that alterations to the data of the base stream immediately affect the new stream.

3 Click **Create**.

The **Create Stream** dialog box appears.



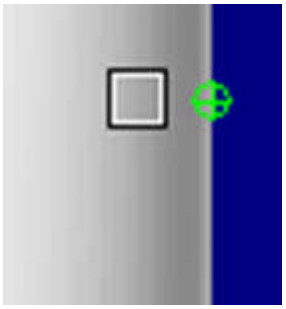
4 Type a name in the **Stream Name** field; then click **OK**.

The **Develop Streams** specifications dialog box appears.

5 Make any desired modifications; then click **OK**.

6 Move the cursor, which appears as a square, to an outlet port.

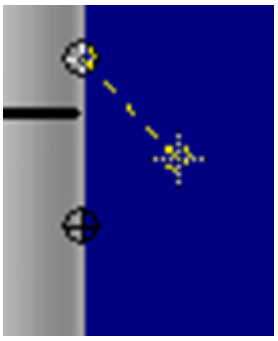
IPE provides intelligent port selection, highlighting the candidate ports in green.



7 Click when you have placed the cursor over the desired outlet port.

8 Move the cursor, which now appears as crosshairs, to an inlet port.

9 Click when you have placed the cursor over the desired inlet port.



Drawing a Disconnected Stream

To draw a disconnected stream:

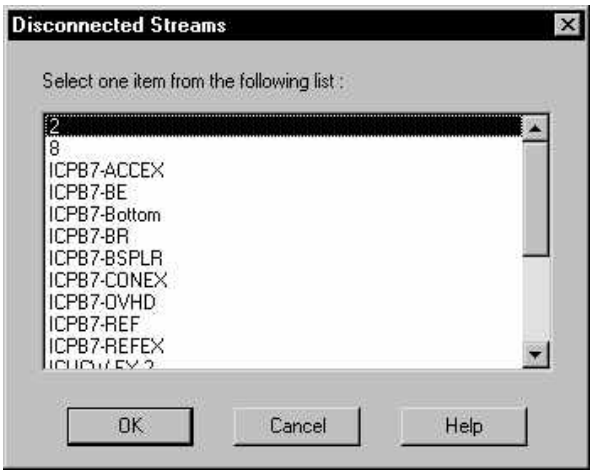
1 Do one of the following:

- On the toolbar, click the **Draw Disconnected Stream** button .

-or-

- On the **View** menu, click **Draw Disconnected Stream**.

The **Disconnected Streams** dialog box appears.



2 Click a stream; then click **OK**.

3 Draw the stream as described in the previous instructions for **Adding a Stream**.

Working with Streams

Right-clicking on a stream accesses a pop-up menu with the following commands.

Use this	to
Modify	Access the Develop Stream dialog box listing the stream's specifications, which you can modify.
Disconnect	Erase the stream from the screen and store it, so that you can select it when using the Draw Disconnected Stream feature (see page 168).
Reconnect Source	Reconnect the stream to a new outlet port.
Reconnect Sink	Reconnect the stream to a new inlet port.
Delete	Delete the stream.

5 Defining Project Components

When developing an Aspen In-Plant Cost Estimator project, project components can be added to areas in Project Explorer's Project view. Project components are the pieces of the process plant that, when linked together, complete a process. Components are categorized as follows:

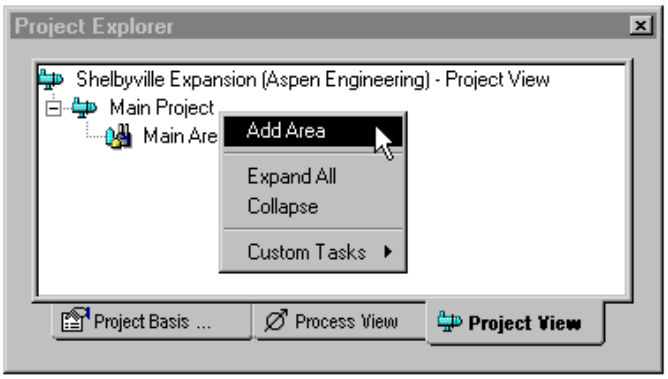
Category	To define
Process Equipment	Equipment for gas, liquids and solids handling and off-site/packaged systems.
Plant Bulks	Material commodities that service a section of the plant or the whole plant. Plant bulks are divided into categories: Piping, Civil, Steel, Instrumentation, Electrical, Insulation and Paint.
Site Development	Modifications that must be done to the site. Site development items are divided into categories: Demolition, Drainage, Earthwork, Fencing, Landscaping, Roads-Slabs-Paving, Piling and Railroads.
Buildings	Civil structures directly involved in the process or for off-site use.
Quoted Equipment	A way to enter special equipment not found in Process Equipment above.
Unit Cost Library	Items from a Unit Cost Library. See Chapter 6, "Developing and Using Cost Libraries."
Equipment Model Library	Items from an Equipment Model Library. See Chapter 6, "Developing and Using Cost Libraries."

See *ICARUS Reference* for information on individual components.

Adding an Area

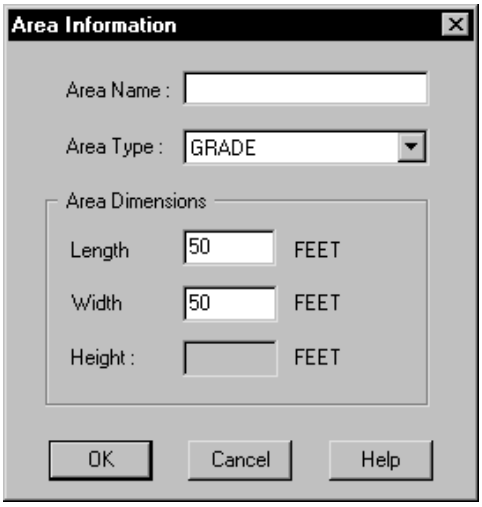
To add an area:

1 In Project Explorer's **Project** view, right-click on the Main Project folder.



2 Click **Add Area** on the pop-up menu.

3 The **Area Information** dialog box appears.



4 Define the area, including name, type, and dimensions.

The Area Type determines how equipment will be installed in the area. See *Icarus Reference*, Chapter 36, for information.

5 Click **OK**.

Project Explorer now displays the new area.

Adding a Project Component

Aspen In-Plant Cost Estimator provides two methods for adding a project component:

Drag-and-drop

Drag a component from the Palette to an area on Project Explorer's Project view and enter an item description. This adds the component to the area without displaying the Component Specifications form; the specifications are left to be entered at your convenience.

Pop-up menu

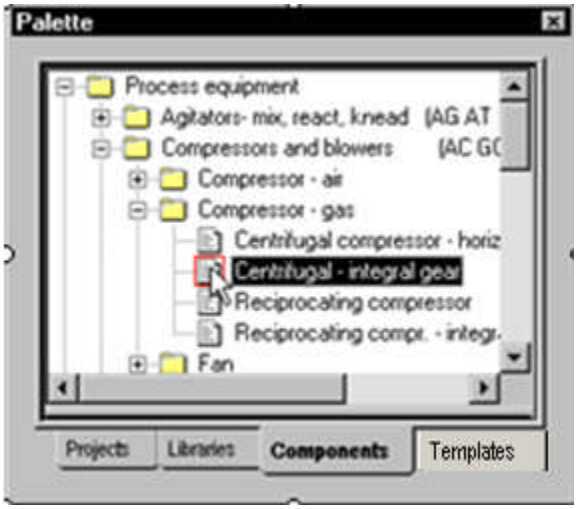
Right-click on an area and click **Add Project Component** from the pop-up menu, then select a component from the **Project Component Selection**

dialog box and enter an item description. This adds the component and also displays the Component Specifications form, where you can complete the component definition right away.

Method 1: Dragging a Component from the Palette

To add a component using the drag-and-drop method:

1 With the Palette (**Components** view) and Project Explorer (**Project** view) displayed, drag a component from the components list to an area on the Project Explorer.

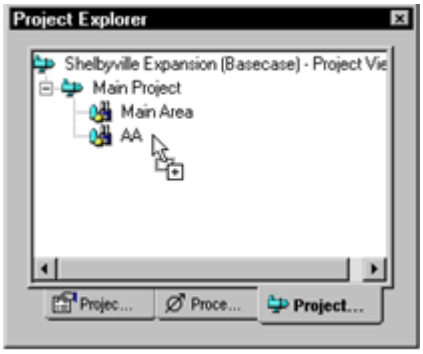


Note: The **Recent Items** folder in the **Components** view stores the last 10 project component selections.

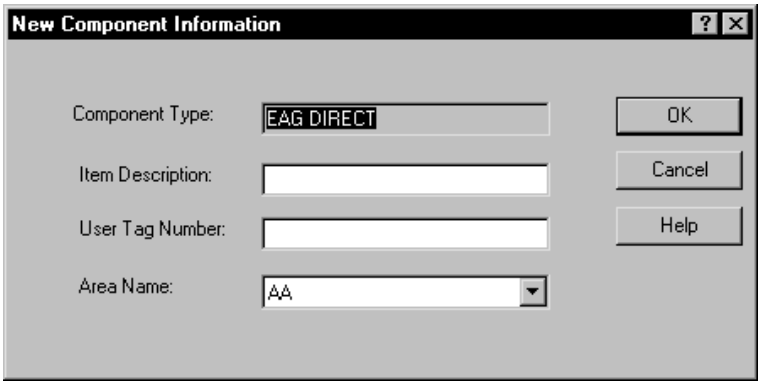
2 To drag, click the component and hold down the mouse button.

3 Move the cursor until over the area where you want to place the component.

4 Release the mouse button.



The **New Component Information** dialog box appears.



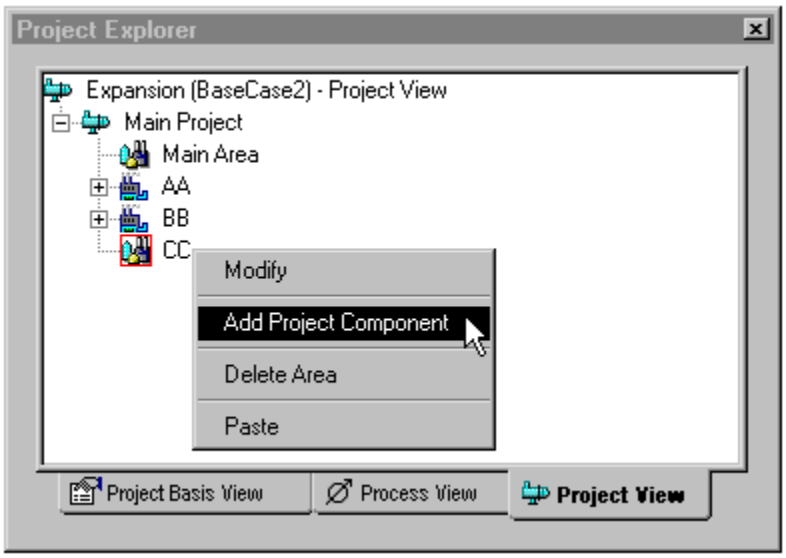
5 Enter an item description (required) and User Tag Number (optional), then click **OK**.

The component is added. Project Explorer displays a block for the component under the selected area. The List view displays general information. You may notice a question mark (?) in the Status column on the List view. This indicates that there are still specifications that need to be entered for the component. To enter the specifications, follow the instructions under *Entering Component Specifications* on page 175.

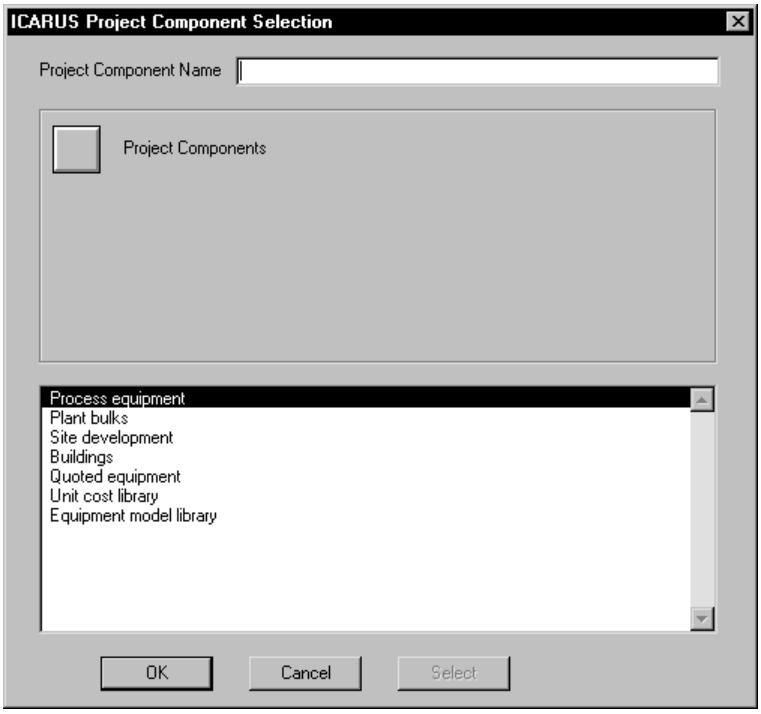
Method 2: Using the Pop-Up Menu

To add a component using the pop-up menu:

1 In Project Explorer (Project view), right-click on an area and click Add Project Component on the pop-up menu.



The **Project Component Selection** dialog box appears.



2 Type the Project Component Name.

3 Highlight the category to which the desired equipment belongs (process equipment, plant bulks, site development, buildings, quoted equipment) and click OK.

Aspen In-Plant Cost Estimator displays a list of sub-categories.

4 Continue to narrow down the selection to a specific component. Then click **OK**.

The component is added to the area.

The Component Specifications form is automatically displayed. You can either complete the definition of the equipment item now or later.

Entering Component Specifications

After adding a component, you still need to enter at least some component specifications to complete the component's definition. Many component specifications have default values used when no value is entered, but most component specifications require further input. If a component added still has any specifications requiring input, a question mark (?) appears in the status column of the List view for that component.

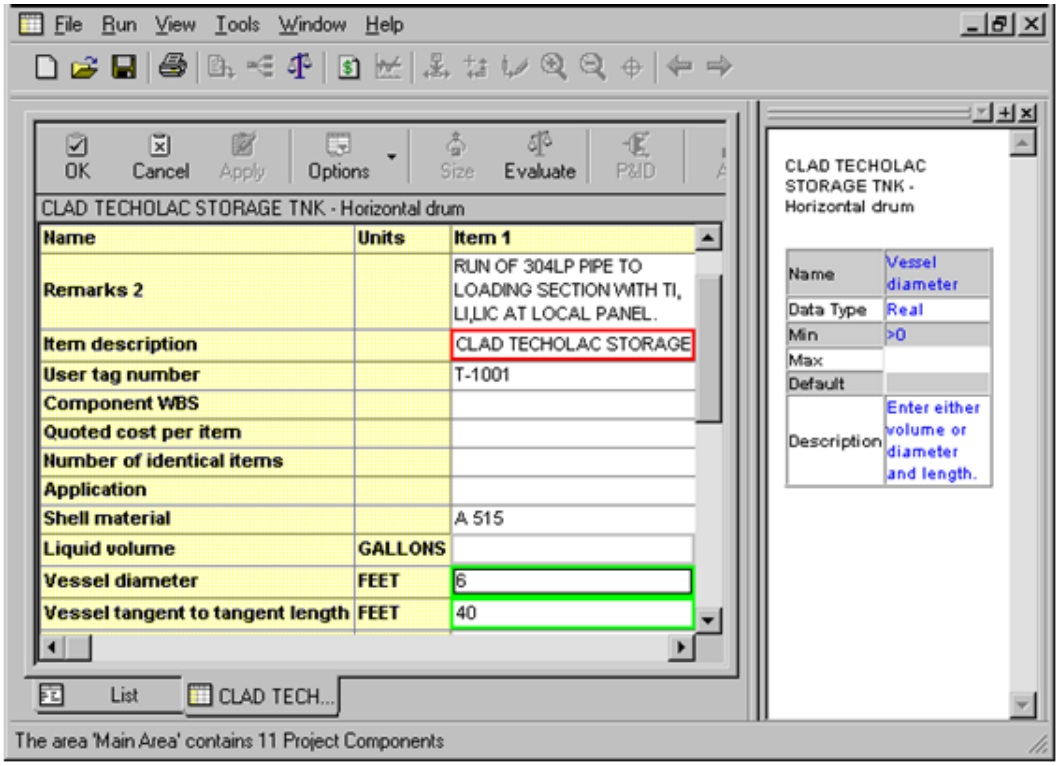
You do not have to enter specifications immediately upon adding a component; you may wish to wait until more information about a project becomes available.

As more information about a project becomes available, you may also wish to modify previously entered component specifications. The following instructions apply as well to modifying previously entered specifications.

To enter or modify component specifications:

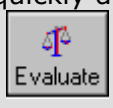
1 If the Component Specifications form is not already displayed in the Main Window, display the form by right-clicking on the component and clicking Modify Item on the pop-up menu. You can right-click on the component in either Project Explorer (Project view) or List view (Area level)

Double-clicking the component will also display the **Specifications** form.


File Run View Tools Window Help
OK Cancel Apply Options Size Evaluate P&ID
CLAD TECHOLAC STORAGE TNK - Horizontal drum
Name Units Item 1
Remarks 2 RUN OF 304LP PIPE TO LOADING SECTION WITH TI, LI,LIC AT LOCAL PANEL.
Item description CLAD TECHOLAC STORAGE
User tag number T-1001
Component WBS
Quoted cost per item
Number of identical items
Application
Shell material A 515
Liquid volume GALLONS
Vessel diameter FEET 6
Vessel tangent to tangent length FEET 40
List
CLAD TECH...
The area 'Main Area' contains 11 Project Components
CLAD TECHOLAC STORAGE TNK - Horizontal drum
Name Vessel diameter
Data Type Real
Min >0
Max
Default
Description Enter either volume or diameter and length.

Color coding

- Red Border: An entry must be made in the field. All specifications forms have at least one required entry field.
- Green Borders and Thick Gray Borders: An entry must be made in either the field with the thick gray border or in the two fields with the green borders. The field with the thick gray borders and the fields with the green borders are mutually exclusive. In the form pictured to the right, either the pump size must be selected or the fluid head and liquid flow rate must be entered. The Properties Window notes this in the Description.

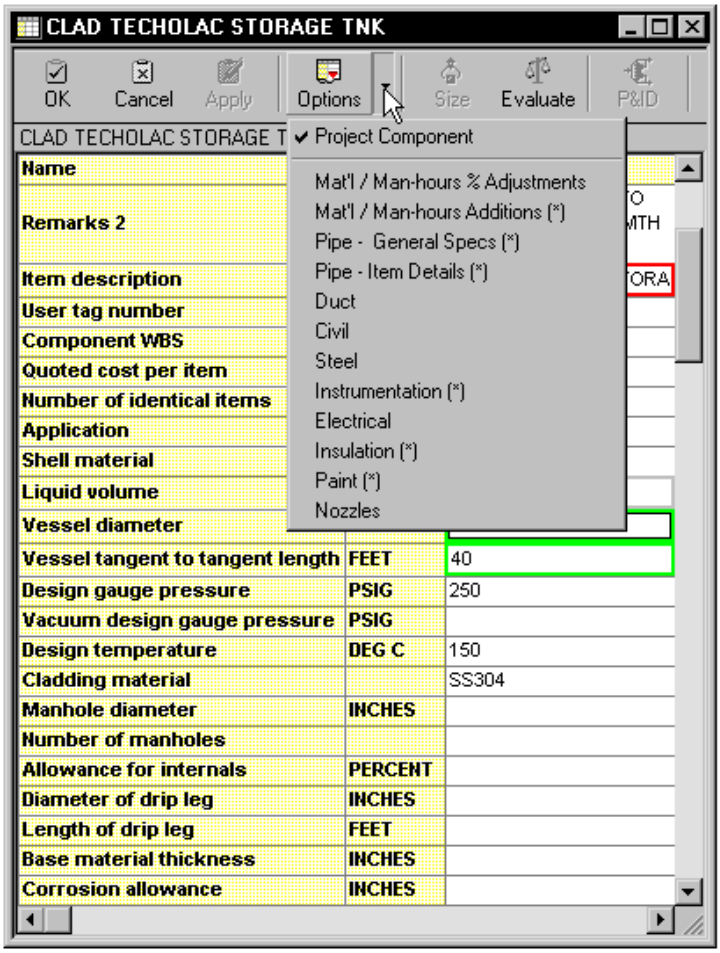
Note: While on either the component or installation bulks specifications form, you can quickly determine the net effect of all your changes by clicking the Evaluate 

button and reviewing the resulting report. See page 270 for more information

Fields with red borders are required. If there's a combination of two fields with green borders and one with a thick gray border, an entry must be made either in the two fields with the green borders or in the field with the thick gray border.

Enter the specifications. Fields with red borders are required. If there's a combination of two fields with green borders and one with a thick gray border, an entry must be made in either in the two fields with the green borders or in the field with the thick gray border.

To define installation bulks for the component, click the Options drop-down and select the type of bulks to define.



See "Defining Installation Bulks" on page 177 for a complete description of installation bulks.

After defining the component and installation bulks, save the specifications form by clicking OK.

Defining Installation Bulks

Installation bulks are items directly associated with the component being defined and are used to complete the installation of the item, for example, a

foundation for a vessel. The difference between an installation bulk and a plant bulk is that an installation bulk is associated with a component, whereas a plant bulk services the whole plant or mill.

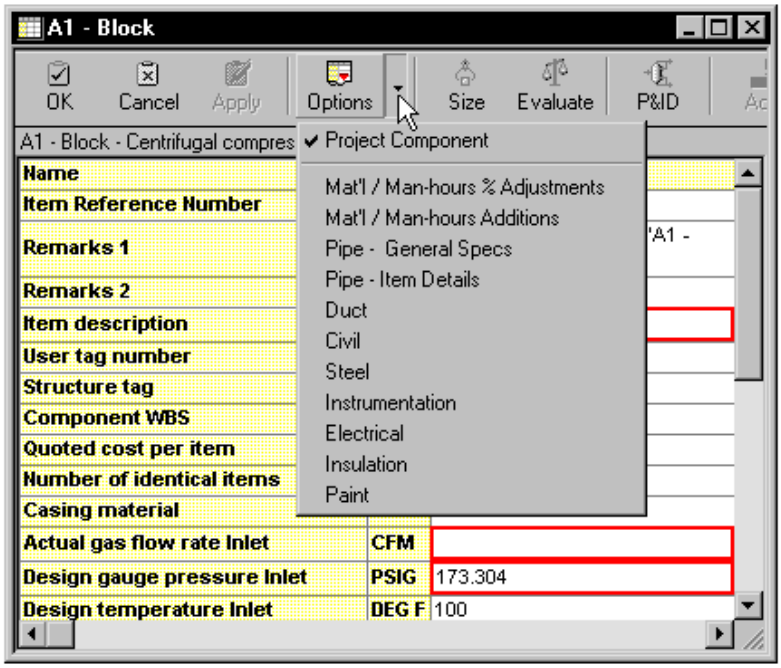
Installation bulks may be defined when entering or modifying equipment or plant bulk specifications.

To access installation bulk specifications:

1 Display the Component Specifications form.

2 Click the down-arrow on the Options button

.



3 Click the type of installation bulks you wish to view or define.

IPE displays the specifications form for the selected installation bulk items. See the subsections that follow for descriptions of the different types of installation bulks.

4 When you are done defining the installation bulk, save your changes in either of two ways, depending on what you intend to do next:

- If you want to continue modifying this component's installation bulks or component specifications, click **Apply** to save the changes. You can now select either Project Component or another type of installation bulks from the Options menu.
- If you are done making changes to the installation bulks and to the component specifications, click OK to save the changes and close the specifications.

Note: You can select in Preferences to have IPE return you to the main Component Specifications form after you click OK (see page 48).

Mat'l / Man-hours Adjustments

Using Mat'l/Man-hours Adjustments, you can specify percent adjustments of system calculated values as follows:

Category	Percent adjustment for
Equipment	Material cost (COA 100-299)
Setting	Man-hours (COA 100-299)
Piping	Material costs and/or man-hours (COA 300-399)
Civil	Material costs and/or man-hours (COA 400-499)
Steel	Material costs and/or man-hours (COA 500-599)
Instrumentation	Material costs and/or man-hours (COA 600-699)
Electrical	Material costs and/or man-hours (COA 700-799)
Insulation	Material costs and/or man-hours (COA 800-899)
Paint	Material costs and/or man-hours. (COA 900-999)

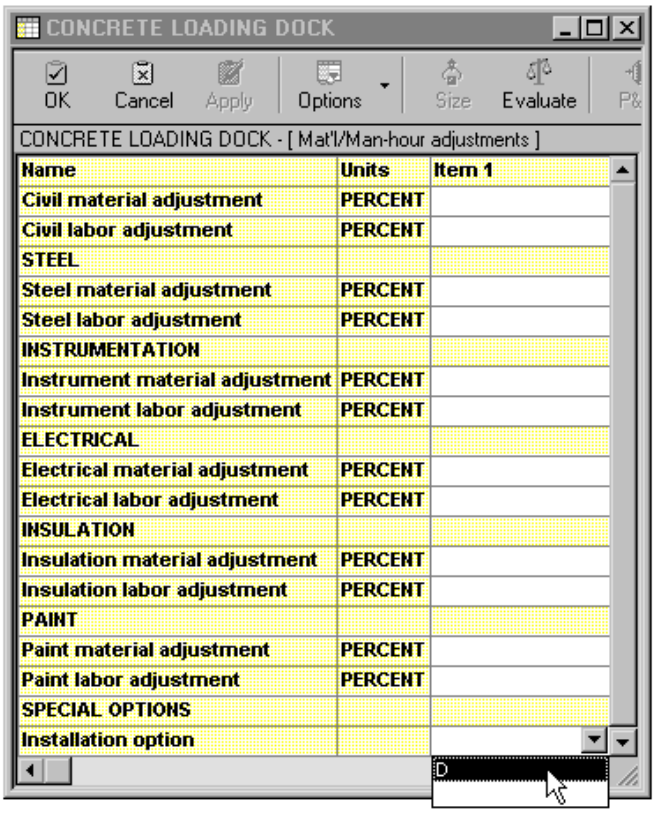
Note: This table refers to ICARUS COA's. If you added your own COA's and re-allocated costs to them, the COA's representing the costs would be different.

These adjustments compound material and man-hour indexing applied to the same COA's. User-entered material costs and man-hours (entered using either Quoted Equipment or Mat'l/Man-hours % Additions) are not affected by these adjustments.

The Special Options section at the bottom of this form lets you specify demolition (that is, dismantlement) of the component and its installation bulks.

To demolish a component:

1. Click **Mat'l/Man-hours Adjustments** on the **Options** menu of the **Component Specifications** form.
2. Scroll down to the **Special Options** section and, on the **Installation** Options list, click **D**.



Selecting the demolition (**D**) option causes the following changes to the component:

- Material costs are set to zero.
- Man-hours and labor costs are charged to demolition COAs (for example, 109, 309, 409, and so on)
- Piping and civil man-hours are down-adjusted:
    - Shop fab man-hours are removed from piping man-hours.
    - Civil formwork/bracing man-hours are removed.

3 Go back through the Mat'l/Man-hour Adjustments form and make the proper adjustments to account for the relative difficulty of demolition versus new build.

For example, if you know unsetting the component is 15% easier than initially setting it, then enter 85% in the Setting labor adjustment field.

4 Save your changes in either of two ways, depending on what you intend to do next:

If you want to continue modifying this component's installation bulks or component specifications, click **Apply** to save the changes to the Mat'l/Man-hour Adjustments. You can now select either Project Component or another type of installation bulks from the Options menu.

If you are done making changes to the installation bulks and to the component specifications, click **OK** to save the changes and close the specifications window.

Mat'l / Man-hours Additions

Using Mat'l/Man-hours Additions, you can add lump sum material costs and/or man-hours to a specified COA. All additions are reported "as is." Additions are neither indexed nor adjusted by Mat'l/Man-hours Adjustments. Up to 20 additions may be defined per component.

Pipe – General Specs

Use Pipe – General Specs to define the rules for developing all installation piping on the selected component. When defining Pipe – General Specs, you can use many fields to define general piping specifications, such as:

- Pressure
- Temperature
- Installation - above or below grade
- Fluid or electric tracing
- Flange class and type
- Stress relief
- Insulation type
- Insulation jacket type
- Paint treatment

Pipe – Item Details

Use Pipe – Item Details to specify individual runs of piping and associated fittings, tracing, paint and insulation. The line is developed using the rules defined with the Pipe – General Specs installation bulk item unless they are re-defined with Pipe – Item Details. Up to 40 lines may be defined/adjusted for each component.

To make more than one specification for Pipe – Item Details:

- Click **Add**.

This adds an item specs column to this form.

To delete any unwanted or unused column(s):

1. Select any cell in that column (or drag for a range of columns).
2. Click **Delete**. Incompletely specified columns must be either completed or deleted before saving.

Note: To reduce the time required to retrieve data when multiple items have been added, select in Preferences to not display all items. If Display P&I Installation Items is unmarked on the Preferences General tab view, selecting Pipe – Item Details will display a dialog box from which you can select the item you wish to edit or select to add a new item. See page 47 for instructions on entering Preferences.

Duct

Duct installation bulk items specify individual runs of process ductwork and associated fittings and insulation. Up to five duct lines may be specified for each component. Use the same methods described for multiple lines of pipe.

Civil

Civil installation bulk items specify bulk excavation and up to three different foundation types/sizes. The available foundation types are listed in the *Icarus Reference*.

From the specified foundation types and volumes, Aspen In-Plant Cost Estimator calculates:

- Excavation and backfill
- Form work (plywood/backup lumber with reuse)
- Rebar
- Sand mat (or ring wall foundation types only)
- Grout
- Anchor bolts/embedments

Automatic Selection and Sizing of Foundations

To have Aspen In-Plant Cost Estimator select and size a foundation for the component:

- Click the **Bulk Requirement** field, click ; then select X.

Aspen In-Plant Cost Estimator will then select and size the foundation based upon component type, dimensions, and weight. The foundation design is further defined based on specified wind and seismic conditions.

Steel

The Steel installation bulk specifies the following:

- Ladders
- Stairs
- Platforms

In addition, up to three different steel items may be specified.

Instrumentation

Instrument installation bulk items specify individual instrumentation loops or parts of loops with associated sensors, transmitters and signal cabling. Up to 50 loops may be defined for each component.

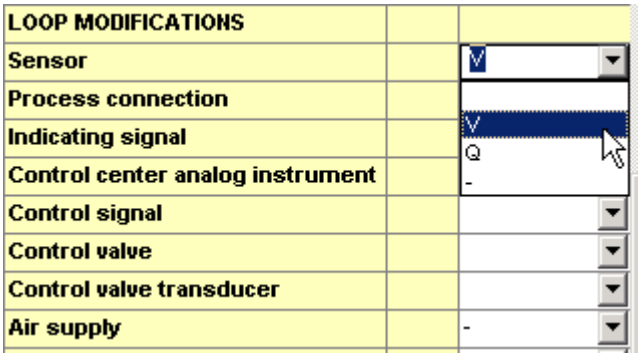
To define more than one adjustment, use the same methods described earlier for Pipe – Item Details (page 181).

Note: To reduce the time required to retrieve data when multiple instrument items have been added, select in Preferences to not display all items. If Display P&I Installation Items is unmarked on the Preferences General tab view, selecting Instrumentation will display a dialog box from which you can select the item you wish to edit or select to add a new item. See page 47 for instructions on accessing and entering Preferences.

Instrument Loop Adjustment

On the Instrumentation Installation Bulk form, there are eight Loop Modification fields, which allow you to remove different elements of the instrument loop from the project. Select "-" from the drop-down menu to remove an element.

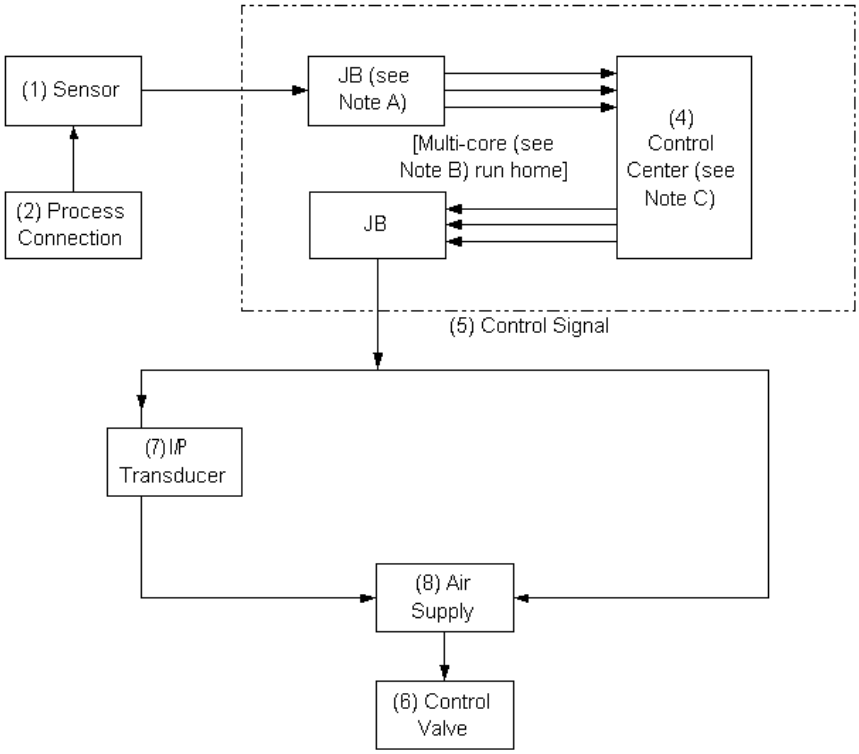
Two of the elements, sensor and control valve, can also be specified as quoted ("Q") or vendor-provided ("V") equipment. When either "Q" or "V" is selected, the system includes installation manhours for the element but not material costs.



Deleting the process connection removes all of the instrument piping.

The indicating signal and control signal runs are reported together, so removing one would decrease the amount of cable and supports by half.

The following diagram shows how the eight adjustable loop elements fit into the loop design:



Notes:

(A) Junction boxes can be found under PLANT BULKS, INSTRUMENTATION, JUNC-BOX.

(B) Multi-core runs can be found under PLANT BULKS, INSTRUMENTATION, ELECTRONIC SIGNAL WIRE. You can specify it with or without the junction box.

(C) Control centers can be found under PLANT BULKS, INSTRUMENTATION, MULTIFUNCTION CONTROLLERS (electronic) or PLANT BULKS, INSTRUMENTATION, INSTRUMENT PANEL – ANALOG (pneumatic).

Electrical

The Electrical installation bulk item specifies local equipment lighting, control wiring and power/cable and motor starters for up to three different type of electrical loads.

Insulation

The Insulation installation bulk item specifies insulation and fireproofing for component and installation bulk steel. For components, the insulation type, jacket type, thickness and area may be specified. For component and steel fireproofing, type, rating and area may be specified.

Automatic Selection of Insulation Requirements

To have Aspen In-Plant Cost Estimator select insulation requirements for the component:

- Click on the Insulation Requirement field, click ; then select X.

Aspen In-Plant Cost Estimator will then select the insulation requirements based on defaults.

You can also have Aspen In-Plant Cost Estimator select component fireproofing and/or steel fireproofing requirements by selecting X in the **Component Fireproofing Requirement** field and/or the **Steel Fireproofing Requirement** field.

Paint

The Paint installation bulk item specifies surface preparation and painting of component and installation bulk steel. Paint for pipe is specified under piping. Entry field specifications include:

- Size of area to be painted
- Number of prime and final coats
- Percent of painted area to be sandblasted
- Galvanizing (for steel)

Automatic Selection of Paint Requirements

To have Aspen In-Plant Cost Estimator select paint requirements for the component:

- Click on the **Component Paint Requirement** field, click ; then select X.

Aspen In-Plant Cost Estimator will then select the paint requirements based on defaults.

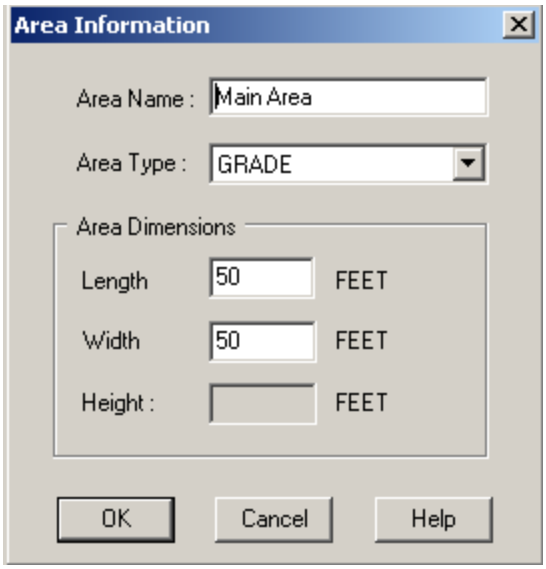
Defining Area Specifications

You can define mechanical design and cost basis specifications for the newly added area. You can define or modify area specifications.

To define area specifications:

1 Right-click on the area in Project Explorer's **Project** view and then click **Modify** on the pop-up menu.

Aspen In-Plant Cost Estimator displays the **Area Information** dialog box.



2 Select the specification category you want to define:

Select	To do this
Area Name	Change the area name.
Area Type	Specify the area type: • EXOPEN • FLOOR • GRADE • OPEN • PAD
Area Dimensions	Specify the Area Dimensions: • Length • Width • Height

3 When you have finished modifying the area, click **OK**.

Importing Areas and Components

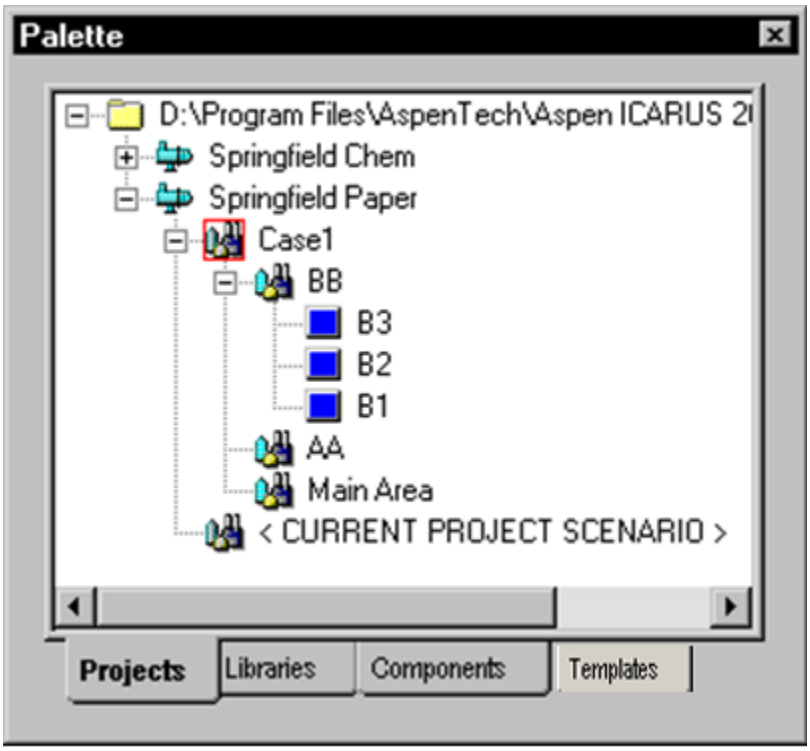
Aspen In-Plant Cost Estimator lets you import entire areas or individual components from other project scenarios. You can select in **Tools| Options | Preferences | Process** whether to also include installation bulks and/or connected streams (see Chapter 1. *Getting Started.Preferences.Process)*. By default, installation bulks are included and connected streams are not.

To import an area or component:

1 In the Palette's **Projects** view, double click on the project scenario from which you wish to import.

This displays the project areas in the scenario.

2 Expand an area folder to display the components in it.



To import a component:

- Drag the component to the desired area in Project Explorer, Project view.

Aspen In-Plant Cost Estimator adds the component to the area.

To import an area and its components:

- Drag the area to Main Project in Project Explorer.

Aspen In-Plant Cost Estimator adds the area and its components.

To import all the components in an area to an existing area in the current project scenario:

- Drag the area from the Palette to the desired area in Project Explorer.

Aspen In-Plant Cost Estimator adds the components to the area without creating a new area.

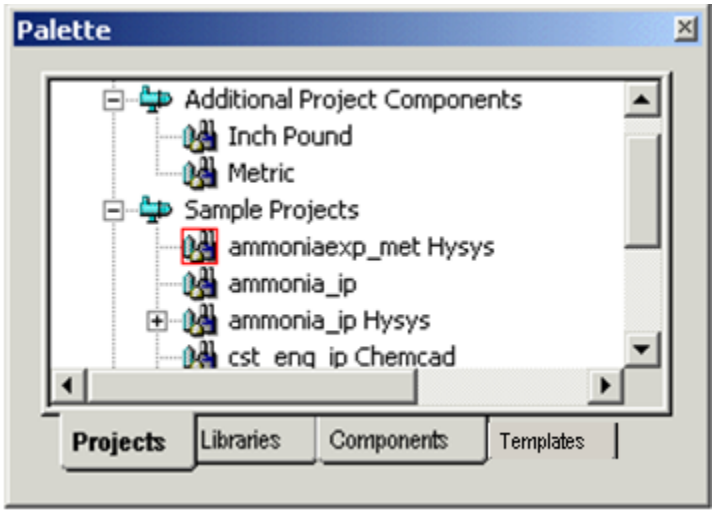
Importing an Entire Scenario

As well as allowing you to import individual areas or components, Aspen In-Plant Cost Estimator lets you import an entire scenario using a drag-and-drop operation. This imports all the areas and components in the selected scenario. You can select in Preferences whether to also include installation bulks and/or connected streams (see page 49). By default, installation bulks are included and connected streams are not.

To import an entire scenario:

1 Have Project Explorer's Project view open, since you will drag the scenario there.

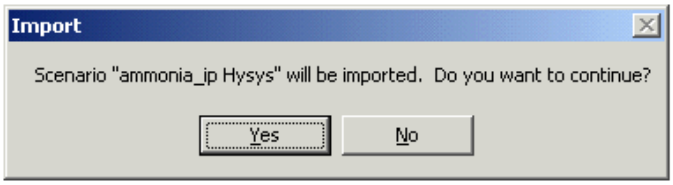
2 Click on the scenario in the Palette's **Projects** view.



Note: you can only import scenarios that have the same units of measure as the current scenario. If the units of measure are not the same, a dialog box will inform you of this when you try to import.

3 Drag the scenario from the Palette to Project Explorer's **Project** view.

Aspen In-Plant Cost Estimator displays a confirmation window.



4 Click **Yes**.

The areas and components of the selected scenario are imported.

Modifying Components

You can modify the following components using **Spreadsheet** View:

- Vessels
- Towers
- Heat Exchangers
- Pumps
- Quoted Components

To modify a component using Spreadsheet View:

1 On the main menu bar, click **View | Spreadsheet View | <the type of component to modify>**.

The **<the type of component to modify>** spreadsheet view appears.

2 On the <**the type of component to modify**>spreadsheet view, click **Options**.

3 On the menu that appears, click the option you want to modify.

4 On the spreadsheet, make your modifications.

5 When you are satisfied with your modifications, click **Apply**.

6 Click **OK**.

Your modifications are made in the project.

Note: You cannot use this feature if a component specs form is open that would let you edit data that would also be editable in the spreadsheet view.

Copying Components

The **Copy** command copies a selected component and all of its associated installation bulks. This is useful if you want to add a component that is similar to an existing item. The item can be copied and modified with less effort than creating a new item.

Remember to change the Item Description when copying components to distinguish the copy from the original.

To copy and paste a component:

1 Right-click on the component in either Project Explorer or the List window (at area level, so that components are listed), and then click **Copy** on the pop-up menu.

You can also copy multiple components at once: select the desired components on the List view, right-click on one of the components, and click **Copy** on the pop-up menu.

2 Right-click on the area to which you want to add the component(s) and click **Paste** on the pop-up menu.

The component is added to the area.

Note: If the area contains a component with the same name as the one being pasted, Aspen In-Plant Cost Estimator changes the pasted component's name so that "#1#" appears at the beginning.

Cut and Paste

If you want to delete (cut) a component from one area and add (paste) it in another area, use the same procedure as above, except click **Cut** instead of **Copy** on the pop-up menu.

Drag and Drop

You can also move a component from one area to another by dragging it.

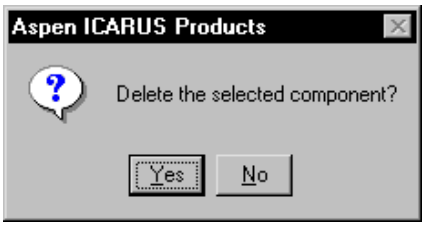
Deleting Components

The Delete command removes a component and all associated installation bulks from the project.

To delete a component:

1 Right-click on the component in either Project Explorer or the List view and click Delete on the pop-up menu.

A confirmation dialog box appears.



Note: You can select in Preferences not to have this prompt appear (see page 47).

2 Click **Yes** to delete the component or click No to retain the component.

You can also delete multiple components at one time: select the components on the List view, right-click on one of the components, and click **Delete** on the pop-up menu.

Re-numbering Components

After deleting components, you may wish to re-number the remaining components so that the numbering contains no gaps and reflects the order in which components were added.

For example, if you add components *A*, *B*, *C*, *D*, and *E* in that order, the automatically generated Order Numbers would be *1*, *2*, *3*, *4*, *5*, respectively (the Order Number appears on the List view). If you then delete components *B* and *C* and re-number, components *A*, *D*, and *E* would have Order Numbers *1*, *2*, *3*, respectively. The order in which they were created would still determine the Order Numbers.

To re-number components:

- On the Run menu, click Re-number and then click Project Components on the sub-menu.

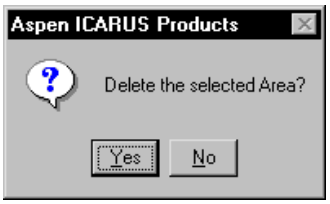
Deleting Areas

The **Delete Area** command removes the selected area and all of its components.

To delete an area:

1 Right-click on the area in Project Explorer and click **Delete Area** on the pop-up menu.

A confirmation dialog box appears.



Note: You can select in Preferences not to have this prompt appear (see page 47).

2 Click **Yes** to delete the area or click No to retain the area.

Re-numbering Areas

Areas have reference numbers that are internally stored and then used by the Evaluation Engine. They are not visible in the current version of Aspen In-Plant Cost Estimator. Just as with components, re-numbering is intended to close gaps in the numbering after deletion.

To re-number areas:

- On the Run menu, click Re-number and then click Project Areas on the sub-menu.

Using the Custom Model Tool

IPE's Custom Model tool lets you base component specifications on formulas or fixed data stored in Excel. Use the tool to send a component's specification values, connection stream values, and specified bulk information (pipe-item details, material and man-hour adjustments) to an Aspen-designed Excel workbook, where you can enter new specification values based on your own data or formulas. Then, use the tool to send the new data back to IPE.

For instance, you could use the Custom Model tool to calculate a pump driver power based on a flow rate and pump head or to calculate project component costs using your own custom method in Excel.

The specifications rules remain stored in Excel, so that you can change the specifications in IPE and then revert back to the Excel specifications by re-running the tool (if the values are fixed). Once the tool has been used with a project component, IPE associates the customized project component with the last Excel spreadsheet used. Running the tool at the project level updates all components for which the tool has already been run.

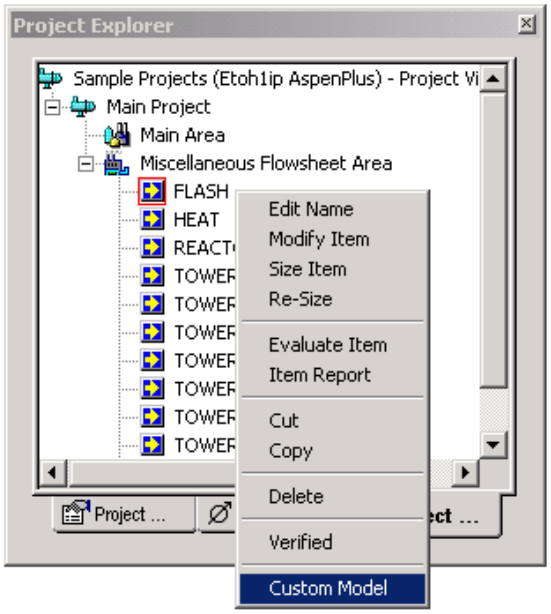
The tool provides template files for mixers and pumps, as well as a general template to use as the starting point for creating files for other components. However, for components other than pumps and mixers, you must first copy

the general template file (or use **Save As**) and enter the slot names for the component specifications you wish to input.

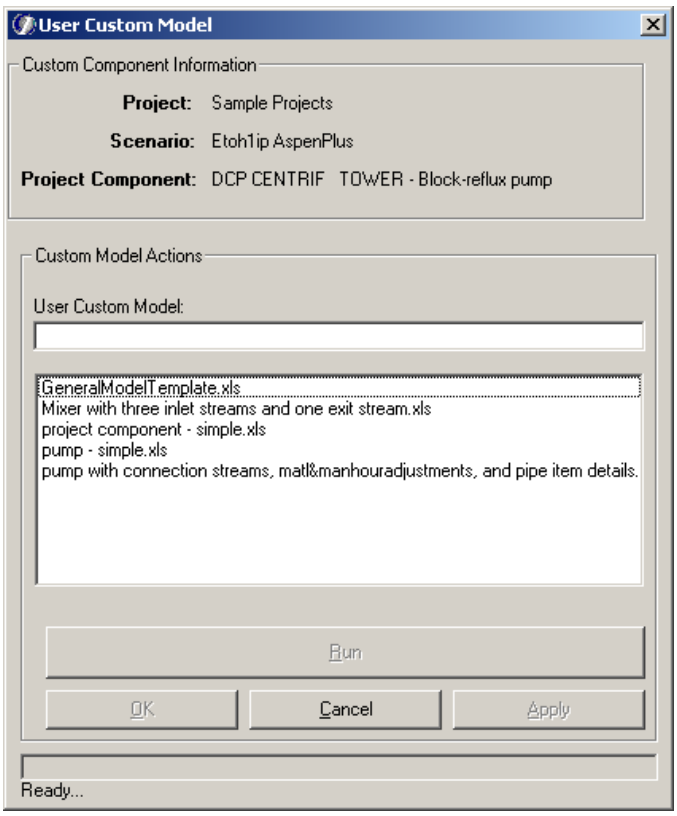
To use the Custom Model tool on a project component:

Note: Before using this tool, you must select the **Activate Custom Model** option on the **Process** tab in **Preferences**. See page 47 for information on accessing Preferences.

1. In Project Explorer, **Project** view, right-click the pump or mixer component that you wish to customize.
2. On the menu that appears, click **Custom Model**.



The **User Custom Model** dialog box appears. It displays the name of the project, scenario, and project component selected for the operation. It also displays available Microsoft Excel (.xls) template files.



3 Click the Excel template file that you have created for the selected project component.

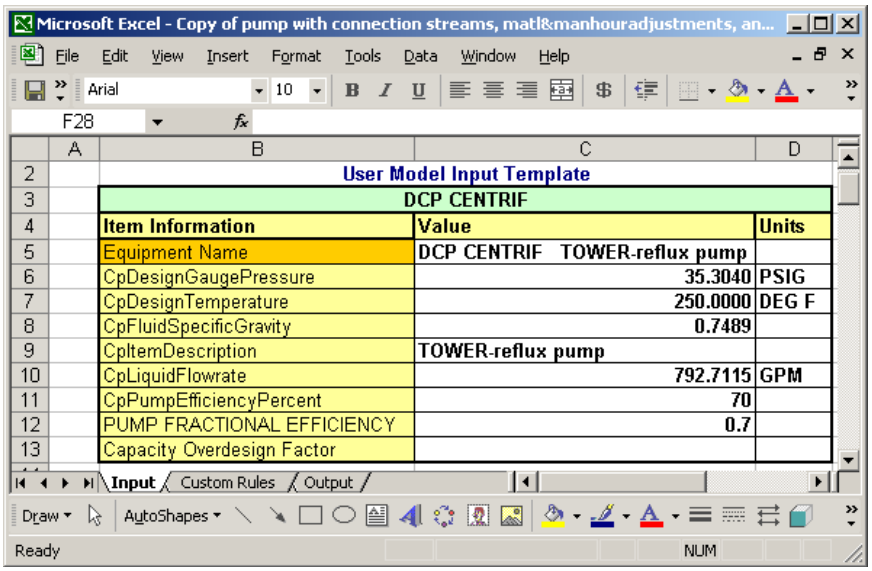
4 Click **Run**.

Excel displays the workbook, with tabs for:

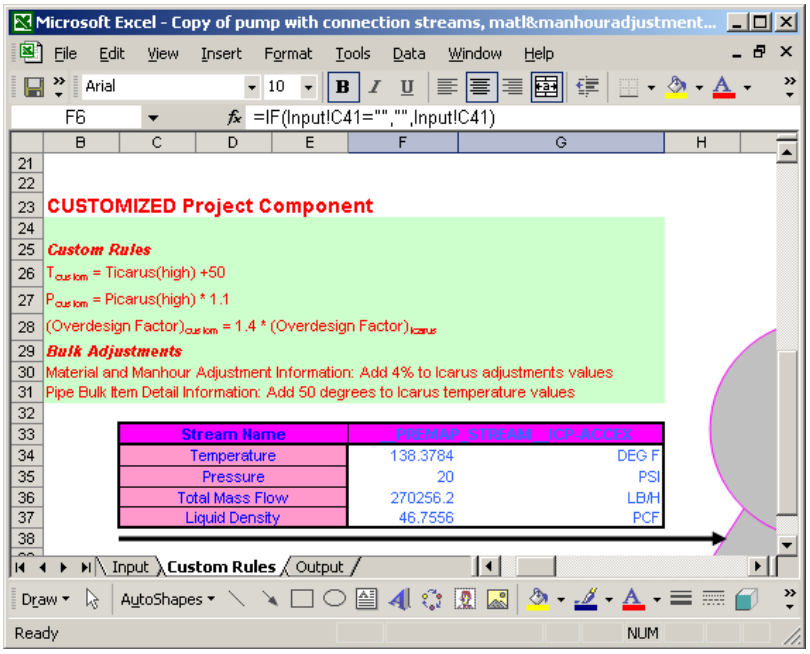
- Input
- Custom Rules
- Output

The **Input** worksheet displays the original Icarus system values from IPE.

- Item information is provided at the top of the worksheet. The item information is from the **Component Specifications** form.
- Stream information, if available, is shown toward the bottom.
- Below the stream information is information on the installation bulks for Material and Man-hour Adjustments and Pipe Item Detail.


Microsoft Excel - Copy of pump with connection streams, matl&manhouradjustments, an...
File Edit View Insert Format Tools Data Window Help
Arial 10
F28
User Model Input Template
DCP CENTRIF
Item Information | Value | Units
Equipment Name | DCP CENTRIF TOWER-reflux pump |
CpDesignGaugePressure | 35.3040 | PSIG
CpDesignTemperature | 250.0000 | DEG F
CpFluidSpecificGravity | 0.7489 |
CpItemDescription | TOWER-reflux pump |
CpLiquidFlowrate | 792.7115 | GPM
CpPumpEfficiencyPercent | 70 |
PUMP FRACTIONAL EFFICIENCY | 0.7 |
Capacity Overdesign Factor |
Input Custom Rules Output
Draw AutoShapes
Ready NUM

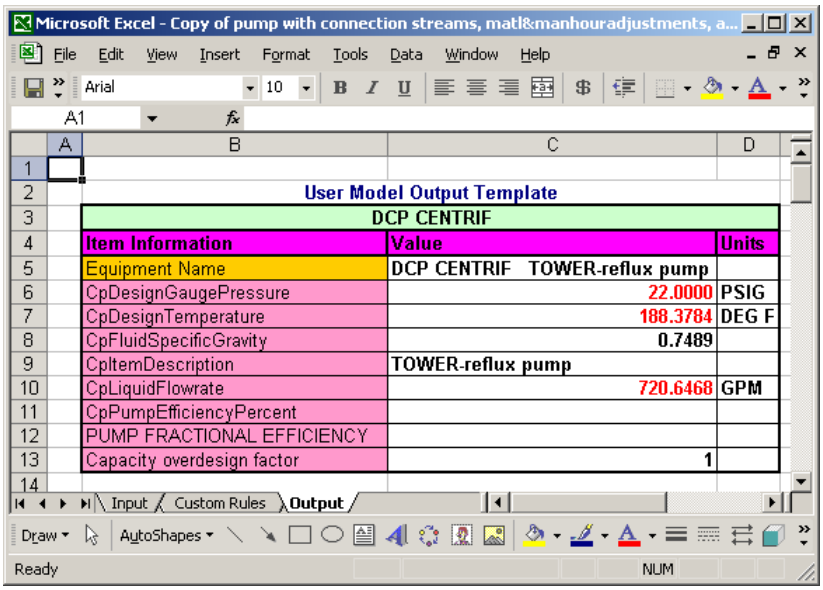
The **Custom Rules** worksheet is provided for storing any data that you may wish to use in the output formulas.


Microsoft Excel - Copy of pump with connection streams, matl&manhouradjustment...
File Edit View Insert Format Tools Data Window Help
Arial 10
F6
=IF(Input!C41="","",Input!C41)
CUSTOMIZED Project Component
Custom Rules
T cus km = Ticarus(high) +50
P cus km = Picarus(high) * 1.1
(Overdesign Factor) cus km = 1.4 * (Overdesign Factor) Icarus
Bulk Adjustments
Material and Manhour Adjustment Information: Add 4% to Icarus adjustments values
Pipe Bulk Item Detail Information: Add 50 degrees to Icarus temperature values
Stream Name | PREMAP STREAM TOP ACCEX
Temperature | 138.3784 | DEG F
Pressure | 20 | PSI
Total Mass Flow | 270256.2 | LB/H
Liquid Density | 46.7556 | PCF
Input Custom Rules Output
Draw AutoShapes
Ready NUM

Input specs have been placed on the **Custom Rules** along with sample alterations for the following:

- Mixer with three inlet streams and one exit stream
- Pump with connection streams, material and man-hour adjustments
- Pipe item details

The **Output** worksheet displays the same component specification slots as on the **Input** worksheet. However, you can customize the values on the **Output** worksheet.


Microsoft Excel - Copy of pump with connection streams, matl&manhouradjustments, a...
File Edit View Insert Format Tools Data Window Help
Arial 10
A1
User Model Output Template
DCP CENTRIF
Item Information | Value | Units
Equipment Name | DCP CENTRIF TOWER-reflux pump |
CpDesignGaugePressure | 22.0000 | PSIG
CpDesignTemperature | 188.3784 | DEG F
CpFluidSpecificGravity | 0.7489 |
CpItemDescription | TOWER-reflux pump |
CpLiquidFlowrate | 720.6468 | GPM
CpPumpEfficiencyPercent |
PUMP FRACTIONAL EFFICIENCY |
Capacity overdesign factor | 1
Input Custom Rules Output
Draw AutoShapes
Ready
NUM

The values are in the same column-row position as on the **Input** worksheet, so that you can easily reference the **Input** data when entering formulas.

You send the entries on the Output worksheet to IPE by clicking **Apply** or **OK** on the **Custom Model** tool.

The following include customized values based on the sample alterations on the **Custom Rules** worksheet:

- Mixer with three inlet streams and one exit stream
- Pump with connection streams, material and man-hour adjustments
- Pipe item details

These customizations have been entered solely for example purposes.

5 Enter new specifications on the **Output** worksheet. For example, if you want to double the **Input** flow rate value provided on Row 10, Column C, enter the following formula:

```
=Input!C10*2
```

6 Go to the Custom Model tool; then click **OK** to send the output to IPE and close the tool.

When you display the specifications form of the component, you will see the values from the Output worksheet.

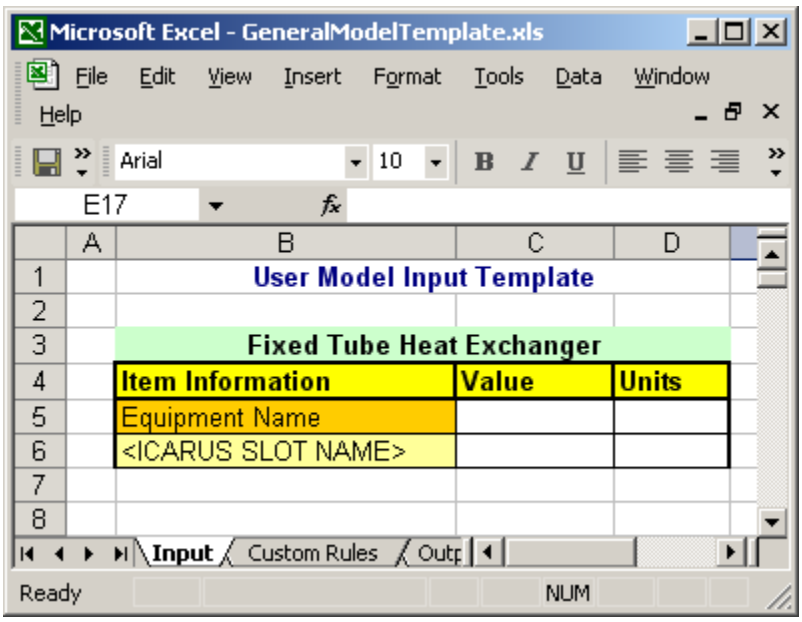
Creating a Template

To create a template for a component:

1 Open **GeneralModelTemplate.xls**; then save it as another file. The folder in which you store Custom Model files is specified on the **Locations** tab in **Preferences** (**APICustomModelDir**). The default is:

```
AspenTech\Economic Evaluation V7.3\Program\API Custom Models
```

2 Starting on Row 6, Column B for item information, enter the slot names for the specifications that you want to have sent from IPE when the file is run for a component.



Slot names for every equipment and plant bulk item are provided in *Icarus Technology Object Definitions* (**API.pdf**). For example, to have the tool send **Shell Design Temperature** to Excel when the file is run for **Fixed Tube Heat Exchangers**, you would need to enter **CPDesignTemperatureShell**.

3 For connection stream information, enter slot names starting on Row 43, Column B.

4 For material and man-hour adjustments, enter slot names starting on row 70, column B.

5 For the pipe-item details, enter slot names starting on row 101, column B.

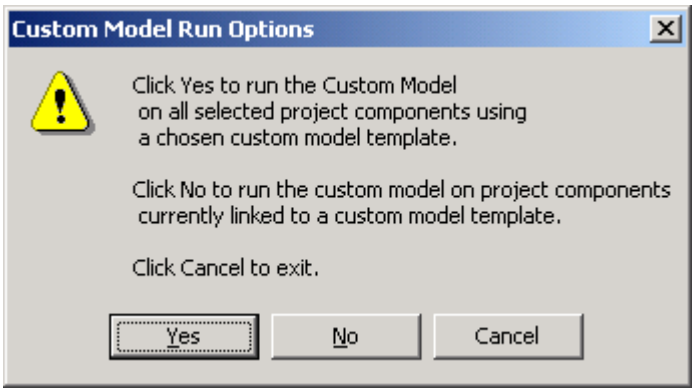
Running the Custom Model Tool at Project-Level for Batch Update

The batch update process for the Custom Model can be done one of two ways.

- The first method is for a batch update of custom model operations performed on project components that are already linked to a custom model template.
- The second method is for a batch update of all selected components.

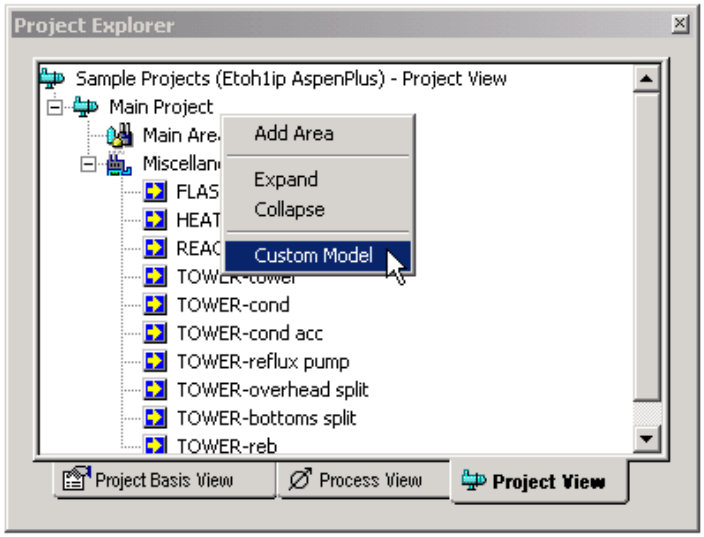
After using the Custom Model tool for any number of components, you can continue to experiment with different specifications and easily revert back to the custom specifications by running the tool at the project level. Simply right-click **Main Project** or **Project Area** in Project Explorer's **Project** view; then click **Custom Model**.

If more than one project component has been selected for the custom model (for example, multi-selection, area selection, project selection), a message box will appear asking you to specify the mode of operation.


Custom Model Run Options
Click Yes to run the Custom Model on all selected project components using a chosen custom model template.
Click No to run the custom model on project components currently linked to a custom model template.
Click Cancel to exit.
Yes
No
Cancel

If you click **Yes**, you will be able to specify a custom model template and all of the selected project components will be processed with the one chosen template.

If you click **No**, only project components with a link to a custom model template will be processed with their associated template.



Note: the output will be based on the values in the **Output** workbook in Excel. If the **Output** workbook contains formulas based on input, changes in input since originally running the Custom Model will affect the output when the Custom Model is re-run.

This re-runs all custom models stored in the Custom Model tool.

Sizing Heat Exchangers

Using only process information, the Heat Exchanger Sizing Expert develops mechanical designs for shell and tube exchangers. This is useful in those cases where you do not have the minimally-required mechanical design information (Surface Area), but you do have process information. Moreover, the Sizing Expert operates interactively, allowing you to modify various thermal and design parameters and quickly investigate the resulting change

in size (preliminary design). The Sizing Expert can size the following heat exchangers:

Air cooler (HE AIR COOLER)

Fixed tube sheet shell and tube exchanger (HE FIXED T S)

Floating head shell and tube exchanger (HE FLOAT HEAD)

U-tube shell and tube exchanger (HE U TUBE)

In the Sizing Expert, you need to select an inlet stream (i.e., a stream carrying fluid to the heat exchanger for heating or cooling) and an outlet stream (that is, a stream carrying heated or cooled fluid from the heat exchanger).

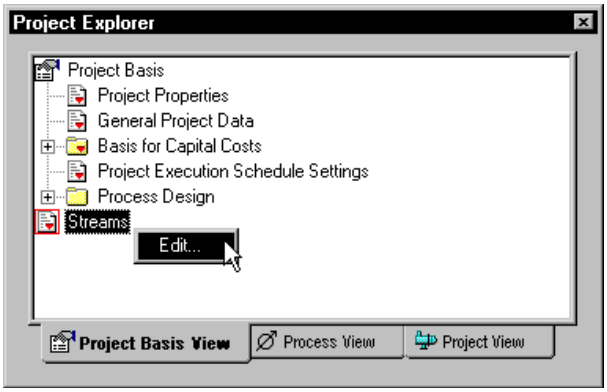
Creating Streams to Connect to the Heat Exchanger

When developing the streams to connect to the heat exchanger, you are in effect specifying what type of fluid the heat exchanger will heat or cool, and from and to what temperature.

In the set of instructions below, the inlet and outlet streams created in the examples carry water at 40 DEG F and 200 DEG F, respectively. The set of instructions following these will show how to size a heat exchanger to heat water from 40 DEG F to 200 DEG F, using the streams created in the examples here.

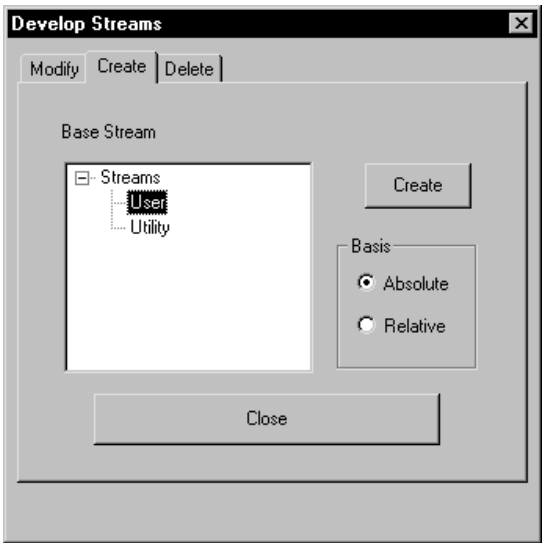
To create an inlet stream and an outlet stream:

1 In Project Explorer's Project Basis view, right-click on Streams and then click Edit.



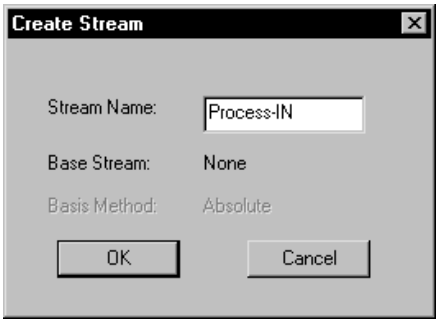
2 At the Develop Streams dialog box, click on the Create tab.

3 Select User in the Streams tree structure. Leave the Basis as Absolute, since you are creating a completely new process stream.



4 Click Create.

5 At the Create Stream dialog box, enter a stream name, such as "Process-IN".



6 Click OK.

7 At the Develop Stream specifications form, specify a primary fluid component, temperature, pressure, and liquid mass flow.

Example:

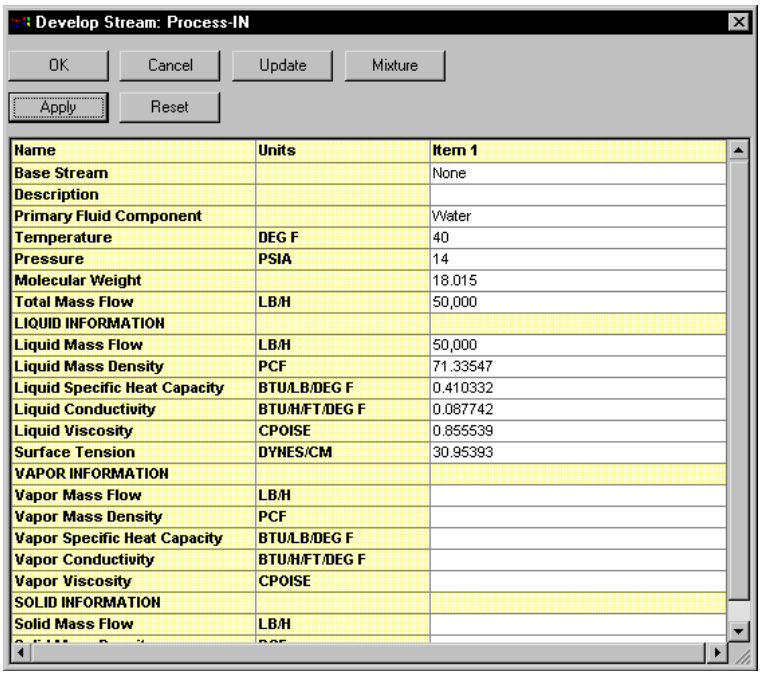
In the Primary Fluid Component field, click and select Water.

In the Temperature (DEG F) field, enter 40.

In the Pressure (PSIA) field, enter 14.

In the Liquid Mass Flow (LB/H) field, enter 50,000.

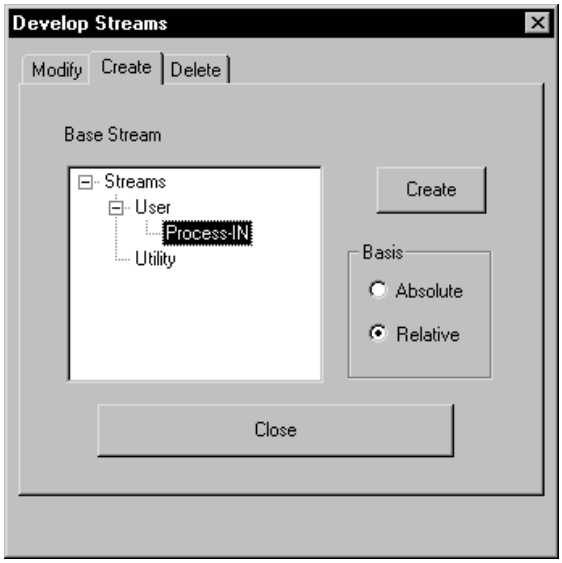
8 Click Apply. Aspen In-Plant Cost Estimator fills in the rest of the fields in the Liquid Information section.



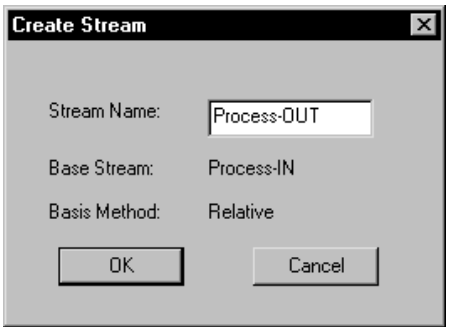
Name	Units	Item 1
Base Stream		None
Description		
Primary Fluid Component		Water
Temperature	DEG F	40
Pressure	PSIA	14
Molecular Weight		18.015
Total Mass Flow	LB/H	50,000
LIQUID INFORMATION		
Liquid Mass Flow	LB/H	50,000
Liquid Mass Density	PCF	71.33547
Liquid Specific Heat Capacity	BTU/LB/DEG F	0.410332
Liquid Conductivity	BTU/H/FT/DEG F	0.087742
Liquid Viscosity	CPOISE	0.855539
Surface Tension	DYNES/CM	30.95393
VAPOR INFORMATION		
Vapor Mass Flow	LB/H	
Vapor Mass Density	PCF	
Vapor Specific Heat Capacity	BTU/LB/DEG F	
Vapor Conductivity	BTU/H/FT/DEG F	
Vapor Viscosity	CPOISE	
SOLID INFORMATION		
Solid Mass Flow	LB/H	

9 Click OK to return to the Develop Streams dialog box, where you now need to create an outlet stream.

10 Click User in the tree structure. Notice that the inlet stream that you just created is now displayed under User. Select that stream and, in the Basis section, mark Relative; the new outlet stream will be based upon the inlet stream.



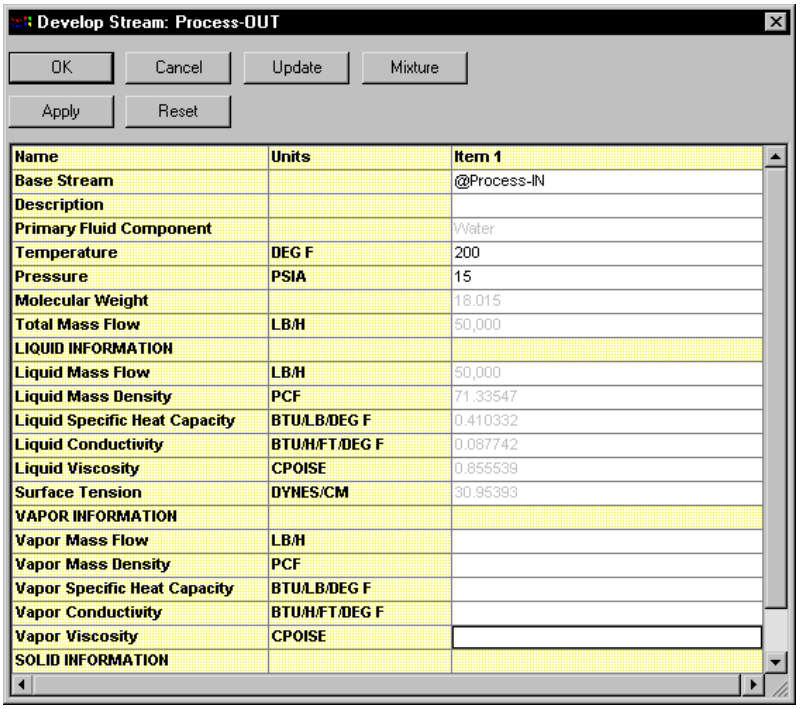
11 At the Create Stream dialog box, enter a stream name, such as "Process-OUT".



12 Click OK.

The Develop Stream specifications form appears. Specifications that appear gray are the same as those of the base stream. Any modifications made will appear black.

13 Enter an outlet stream temperature that corresponds to temperature to which the heat exchanger will be heating the fluid. In the example below, the temperature has been entered as 200 DEG F and the pressure has been entered as 15 PSIA. The other specifications are the same as the base stream's.



Name	Units	Item 1
Base Stream		@Process-IN
Description		
Primary Fluid Component		Water
Temperature	DEG F	200
Pressure	PSIA	15
Molecular Weight		18.015
Total Mass Flow	LB/H	50,000
LIQUID INFORMATION		
Liquid Mass Flow	LB/H	50,000
Liquid Mass Density	PCF	71.33547
Liquid Specific Heat Capacity	BTU/LB/DEG F	0.410332
Liquid Conductivity	BTU/H/FT/DEG F	0.087742
Liquid Viscosity	CPOISE	0.855539
Surface Tension	DYNES/CM	30.95393
VAPOR INFORMATION		
Vapor Mass Flow	LB/H	
Vapor Mass Density	PCF	
Vapor Specific Heat Capacity	BTU/LB/DEG F	
Vapor Conductivity	BTU/H/FT/DEG F	
Vapor Viscosity	CPOISE	
SOLID INFORMATION		

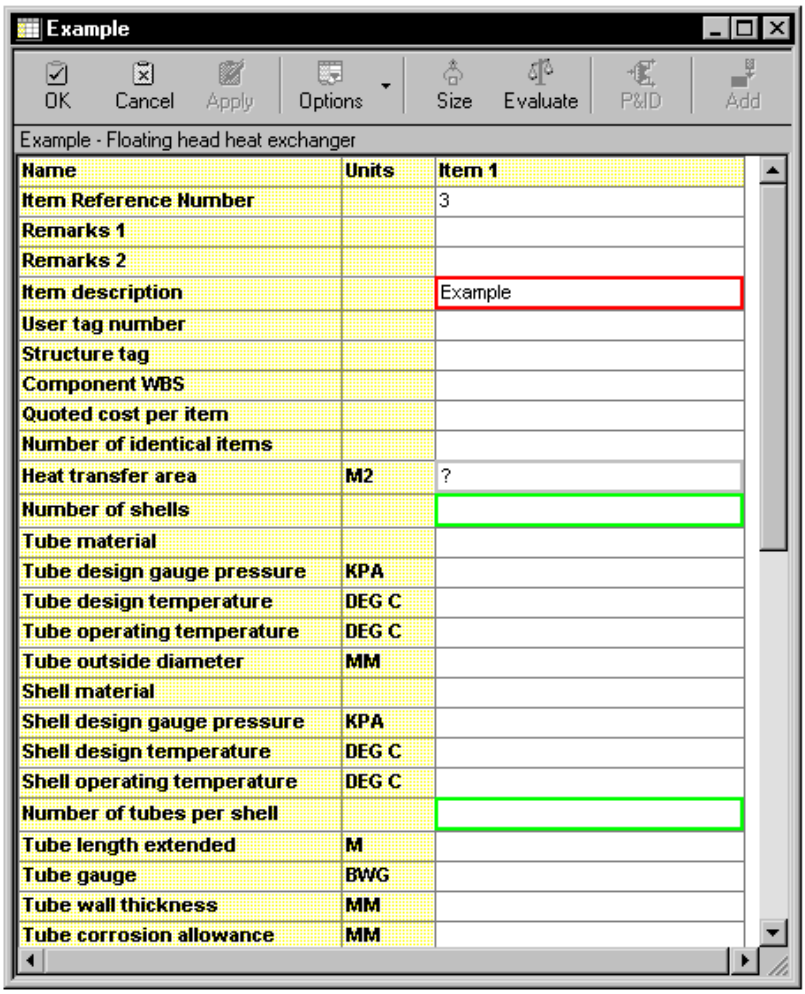
14 Click **OK** to apply the changes and return to the **Develop Streams** dialog box, which you can now close.

Interactive Sizing

With the necessary streams created, you are ready to use the Sizing Expert.

To size a heat exchanger:

1 Add a heat exchanger, such as a floating head shell and tube exchanger, and display the Component Specifications form. (See page 172 for instructions on adding components.)

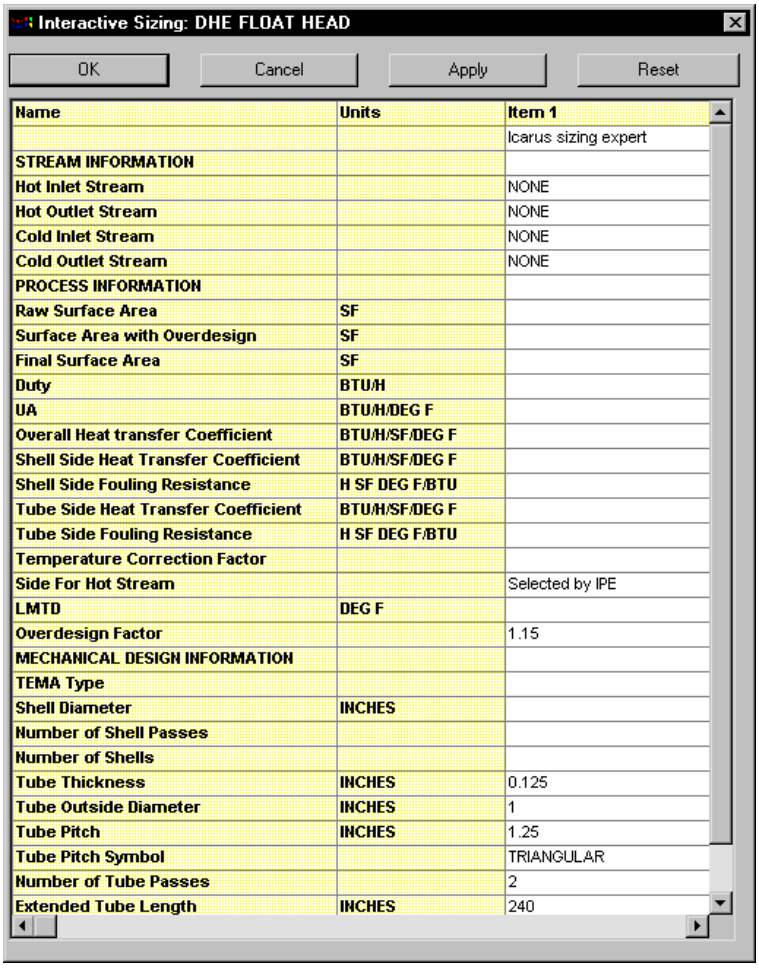


Name	Units	Item 1
Item Reference Number		3
Remarks 1		
Remarks 2		
Item description		Example
User tag number		
Structure tag		
Component WBS		
Quoted cost per item		
Number of identical items		
Heat transfer area	M2	?
Number of shells		
Tube material		
Tube design gauge pressure	KPA	
Tube design temperature	DEG C	
Tube operating temperature	DEG C	
Tube outside diameter	MM	
Shell material		
Shell design gauge pressure	KPA	
Shell design temperature	DEG C	
Shell operating temperature	DEG C	
Number of tubes per shell		
Tube length extended	M	
Tube gauge	BWG	
Tube wall thickness	MM	
Tube corrosion allowance	MM	

It is not necessary to enter any values on the specifications form before starting the Sizing Expert. However, all applicable sizing parameters that are entered in the component specifications form will be carried over automatically to the sizing expert and used in calculations.

2 Click the **Size** button.

The **Interactive Sizing** form appears.



Name	Units	Item 1
		Icarus sizing expert
STREAM INFORMATION		
Hot Inlet Stream		NONE
Hot Outlet Stream		NONE
Cold Inlet Stream		NONE
Cold Outlet Stream		NONE
PROCESS INFORMATION		
Raw Surface Area	SF	
Surface Area with Overdesign	SF	
Final Surface Area	SF	
Duty	BTU/H	
UA	BTU/H/DEG F	
Overall Heat transfer Coefficient	BTU/H/SF/DEG F	
Shell Side Heat Transfer Coefficient	BTU/H/SF/DEG F	
Shell Side Fouling Resistance	H SF DEG F/BTU	
Tube Side Heat Transfer Coefficient	BTU/H/SF/DEG F	
Tube Side Fouling Resistance	H SF DEG F/BTU	
Temperature Correction Factor		
Side For Hot Stream		Selected by IPE
LMTD	DEG F	
Overdesign Factor		1.15
MECHANICAL DESIGN INFORMATION		
TEMA Type		
Shell Diameter	INCHES	
Number of Shell Passes		
Number of Shells		
Tube Thickness	INCHES	0.125
Tube Outside Diameter	INCHES	1
Tube Pitch	INCHES	1.25
Tube Pitch Symbol		TRIANGULAR
Number of Tube Passes		2
Extended Tube Length	INCHES	240

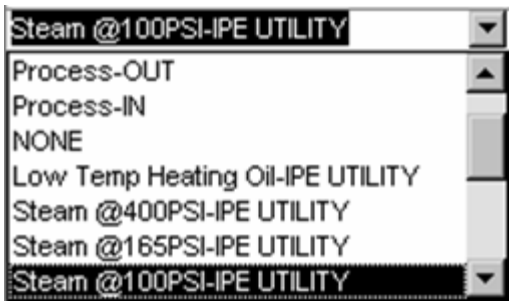
Notes: In order for the Sizing Expert to run, you must select process fluid streams (one at Inlet and one at Outlet conditions) for at least one side (hot or cold side). Any other data you provide (for example, Duty, Overall heat transfer coefficient, LMTD, and so on) helps the Expert do its job better, but is not necessary.

3 Click on the Hot Inlet Stream field and then click to access a drop-down list that includes all utility resources and user-created streams.

Note: "fluid" refers to liquid or gas.

4 If you are ***heating*** a fluid, as in the example, select a utility resource to use as the heating source. The tables on the following page provide definitions of the utility resources.

To heat a fluid from 40 DEG F to 200 DEG F, as in the example, the utility Steam @100PSI-IPE UTILITY is appropriate.



-or-

If you are ***cooling*** a fluid, select the stream carrying the fluid to be cooled.

Default Utility Resources Available for I-P Projects

	Inlet temperature (DEG F)	**Exit temperature (DEG F)**	**Operating Pressure (PSIA)**	**Utility type**
Steam @100PSI	327	327	100	Heat source
Steam @165PSI	363	363	165	Heat source
Steam @400PSI	444	444	400	Heat source
Low Temp Heating Oil	600	550	25	Heat source
High Temp Heating Oil	725	675	25	Heat source
Refrigerant – Freon 12	-21	-21	15.5	Heat sink
Refrigerant – Ethylene	-150	-150	15.5	Heat sink
Refrigerant – Ethane	-130	-130	15.5	Heat sink
Refrigerant – Propylene	-50	-50	15.5	Heat sink
Refrigerant – Propane	-40	-40	15.5	Heat sink
Cooling Water	95	75	50	Heat sink

Default Utility Resources Available for METRIC Projects

	Inlet temperature (DEG C)	**Exit temperature (DEG C)**	**Operating Pressure (KPA)**	**Utility type**
Steam @2760KPA	229.2	229.2	2760	Heat source
Steam @1135KPA	184	184	1135	Heat source
Steam @690KPA	164	164	690	Heat source

Default Utility Resources Available for METRIC Projects

	Inlet temperature (DEG C)	Exit temperature (DEG C)	Operating Pressure (KPA)	Utility type
Low Temp Heating Oil	315	287	2523	Heat source
High Temp Heating Oil	385	357	2523	Heat source
Refrigerant – Freon 12	-29.8	-29.8	105	Heat sink
Refrigerant – Ethylene	-101	-101	105	Heat sink
Refrigerant – Ethane	-90	-90	105	Heat sink
Refrigerant – Propylene	-45	-45	105	Heat sink
Refrigerant – Propane	-40	-40	105	Heat sink
Cooling Water	35	24	105	Heat sink

5 Click on the Hot Outlet Stream field and then click to access the drop-down list of utility resources and user-created streams.

6 If you are ***heating*** a fluid, select again the utility to use as the heating source.

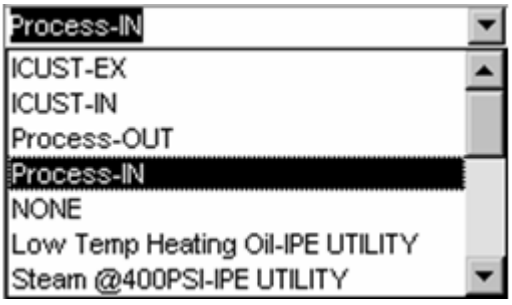
-or-

If you are ***cooling*** a fluid, select the stream carrying the cooled fluid from the exchanger.

7 Click on the **Cold Inlet Stream** field and then click to access the drop-down list of utility resources and user-created streams.

8 If you are *heating* a fluid, select the stream carrying the fluid to be heated.

9 **A** If you are following the example, select the Process-IN stream that you created in the previous set of instructions (see "Creating Streams," pages 198 through 201).

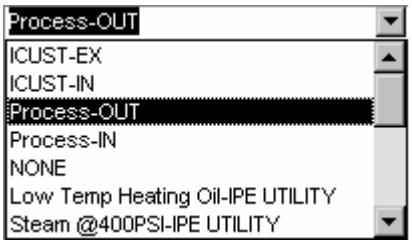


B If you are *cooling* a fluid, select a heat sink utility to use as a cooling medium.

Click on the **Cold Outlet Stream** field and then click to access the drop-down list of utility resources and user-created streams.

10 If you are *heating* a fluid, select the stream carrying the heated fluid from the exchanger.

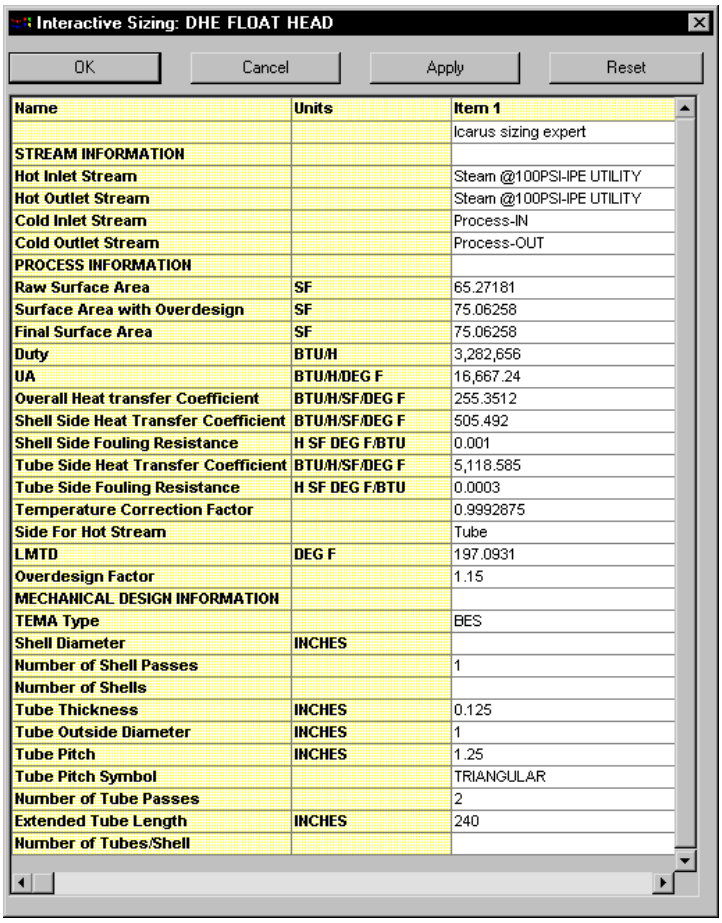
11 If you are following the example, select the Process-OUT stream that you created in the previous set of instructions (see "Creating Streams," page 198).



12 If you are *cooling* a fluid, select again the heat sink utility to use as the cooling medium.

13 Click Apply.

Aspen In-Plant Cost Estimator fills in the other fields on the **Interactive Sizing** form.



Name	Units	Item 1
		Icarus sizing expert
STREAM INFORMATION		
Hot Inlet Stream		Steam @100PSI-IPE UTILITY
Hot Outlet Stream		Steam @100PSI-IPE UTILITY
Cold Inlet Stream		Process-IN
Cold Outlet Stream		Process-OUT
PROCESS INFORMATION		
Raw Surface Area	SF	65.27181
Surface Area with Overdesign	SF	75.06258
Final Surface Area	SF	75.06258
Duty	BTU/H	3,282,656
UA	BTU/H/DEG F	16,667.24
Overall Heat transfer Coefficient	BTU/H/SF/DEG F	255.3512
Shell Side Heat Transfer Coefficient	BTU/H/SF/DEG F	505.492
Shell Side Fouling Resistance	H SF DEG F/BTU	0.001
Tube Side Heat Transfer Coefficient	BTU/H/SF/DEG F	5,118.585
Tube Side Fouling Resistance	H SF DEG F/BTU	0.0003
Temperature Correction Factor		0.9992875
Side For Hot Stream		Tube
LMTD	DEG F	197.0931
Overdesign Factor		1.15
MECHANICAL DESIGN INFORMATION		
TEMA Type		BES
Shell Diameter	INCHES	
Number of Shell Passes		1
Number of Shells		
Tube Thickness	INCHES	0.125
Tube Outside Diameter	INCHES	1
Tube Pitch	INCHES	1.25
Tube Pitch Symbol		TRIANGULAR
Number of Tube Passes		2
Extended Tube Length	INCHES	240
Number of Tubes/Shell		

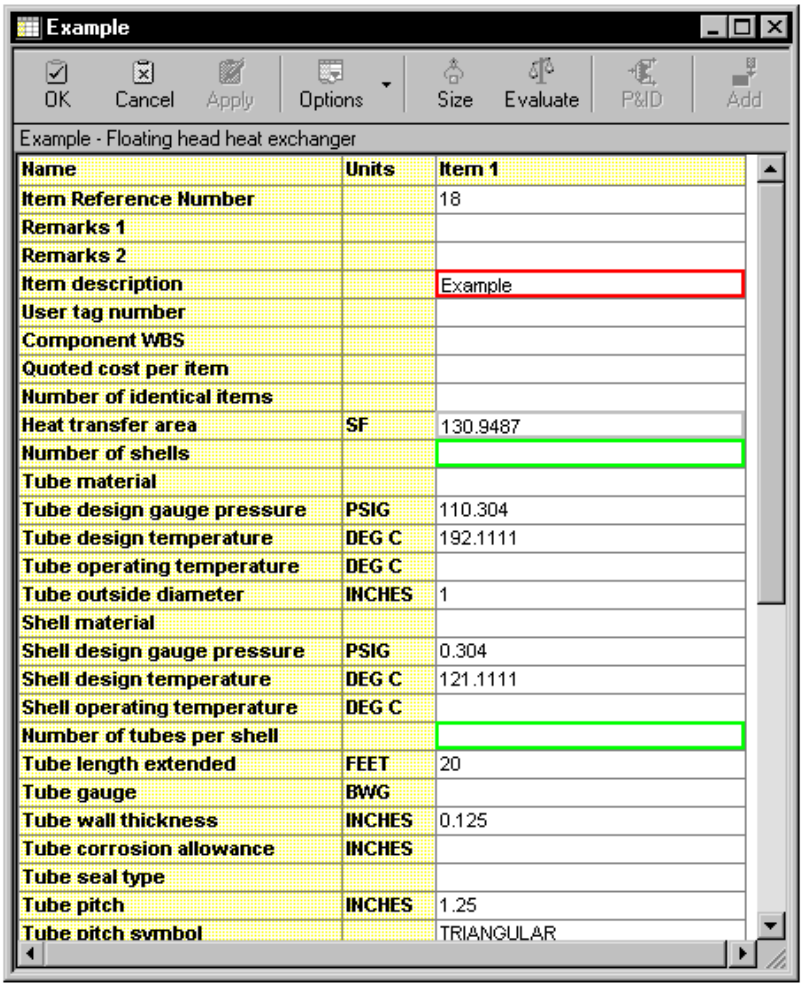
Note: results are not transferred to the Component Specifications form until you click OK and the sizing is successfully completed (i.e., without generating error messages).

14 Click **OK**.

Aspen In-Plant Cost Estimator provides a message informing you of the overdesign factor.

15 Click **OK** to accept this message.

The values obtained from Interactive Sizing now appear on the **Component Specifications** form.



Name	Units	Item 1
Item Reference Number		18
Remarks 1		
Remarks 2		
Item description		Example
User tag number		
Component WBS		
Quoted cost per item		
Number of identical items		
Heat transfer area	SF	130.9487
Number of shells		
Tube material		
Tube design gauge pressure	PSIG	110.304
Tube design temperature	DEG C	192.1111
Tube operating temperature	DEG C	
Tube outside diameter	INCHES	1
Shell material		
Shell design gauge pressure	PSIG	0.304
Shell design temperature	DEG C	121.1111
Shell operating temperature	DEG C	
Number of tubes per shell		
Tube length extended	FEET	20
Tube gauge	BWG	
Tube wall thickness	INCHES	0.125
Tube corrosion allowance	INCHES	
Tube seal type		
Tube pitch	INCHES	1.25
Tube pitch symbol		TRIANGULAR

16 Click **OK** to save.

You can now run an item evaluation and see the values generated by the Sizing Expert in the item report. An item report for the above example is shown on page 273.

6 Developing and Using Cost Libraries

The Libraries view on the Palette arranges libraries in a tree-structure. Most of the libraries listed access project specifications (explained in Chapter 3). The Cost Libraries are unique, however, in that they comprise collections of particular cost items that you can add as project components. The cost libraries are customizable; you can add items to the libraries provided, as well as add your own libraries.

Aspen In-Plant Cost Estimator includes two types of cost libraries: Equipment Model Library (EML) and Unit Cost Library (UCL). Each library type may include one or more library files, which in turn may contain one or more library items, each representing a particular type of cost item.

Equipment Model Library (EML)

The EML is intended to store custom equipment items, for which you create component specification forms. In a project, you can add an item from the EML as a component and fill out the form that you earlier created.

The library can store a generic equipment item that comes in discrete sizes, such as an extruder, or an equipment item that follows a continuous cost-capacity relationship such as linear, semi-log or log-log.

Unit Cost Library (UCL)

The UCL is intended to store and retrieve direct costs and installation man-hours, which are based on a simple unit of measure (for example, the cost of a material item or installation man-hours per unit of area, per unit of length, per item, and so on). Costs can also be stored in a library for indirect items such as project management man-hours per month, crane rental (plant hire) on a daily, weekly, monthly basis, and so on

For one-of-a-kind cost items not worth storing in a library, the unit cost library may be used to create a dummy item for recall and modification in a project. The dummy item is stored in the library with as little data as possible. This can be retrieved and modified in as much detail as required whenever you need a one-time cost added into a project.

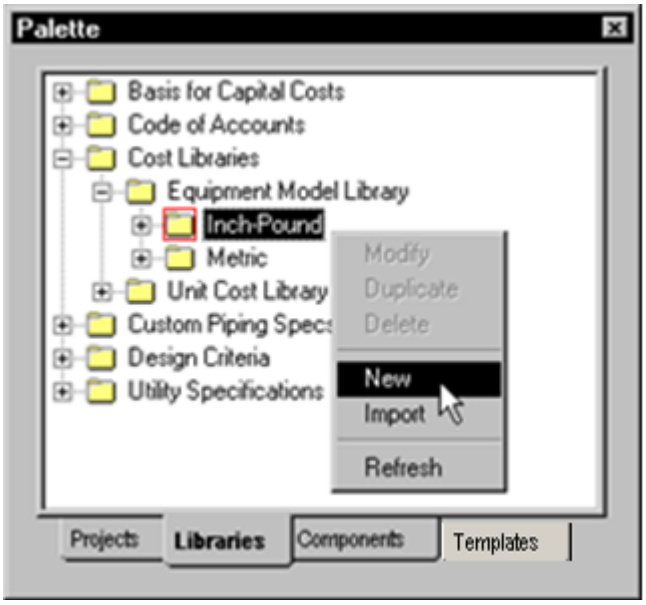
Developing and Using an Equipment Model Library (EML)

Creating an EML

The instructions in this sub-section show you how to create an EML. The instructions in the sub-sections that follow this one, which show you how to add an item to an EML and then add the item to a project, use a single example that can be added either to an Inch-Pound EML that you created or to one of the two Inch-Pound EML's provided.

To create an EML:

1 With no project open, go to the Palette's Libraries tab view. Expand Cost Libraries in the tree-structure, and then expand Equipment Model Library.

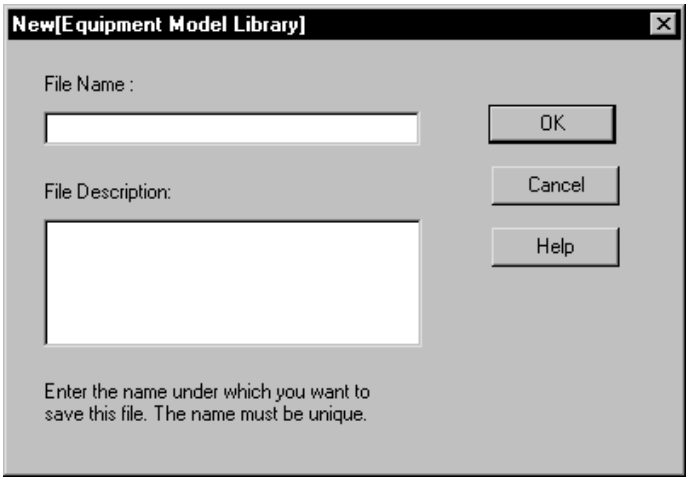


The libraries are divided into Inch-Pound and Metric.

To create a library for use in projects with an Inch-Pound units of measure basis, as in the example:

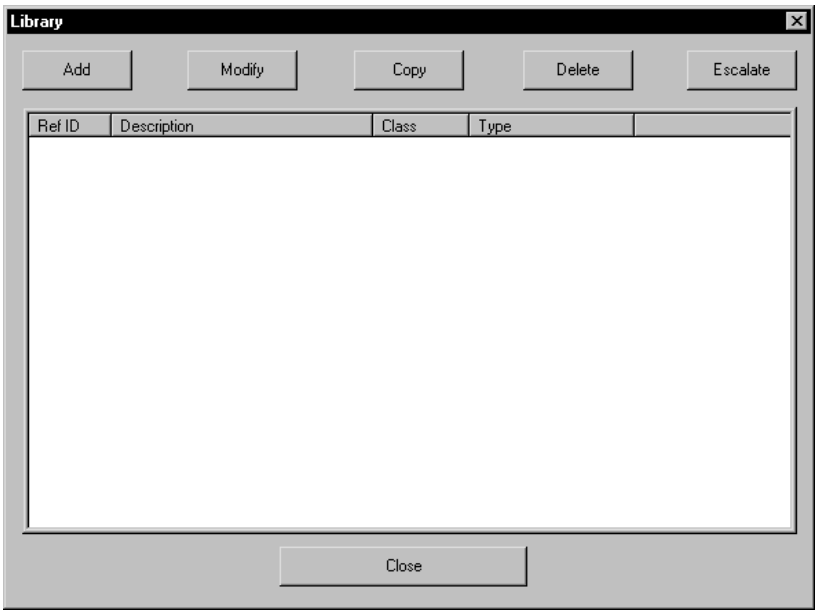
1 Right-click on Inch-Pound and click New on the pop-up menu.

The **New Equipment Model Library** dialog box appears.



2 Enter a file name (required) for the EML and a brief description (optional), then click **OK**.

An empty **Library** dialog box appears.



3 You can now add items to the new library.

Adding an Item to an EML

The instructions below for defining and using an EML item follow a single example from item creation through the addition of the item to a project. Using the example provided will define the item in such a way that it automatically generates a foundation and/or electrical power supply bulks.

To add an item to an EML:

1 If you just added a library, the Library dialog box is displayed, and you may skip to Step 2. If not, follow these steps:

2 Go to the Palette's Libraries tab view.

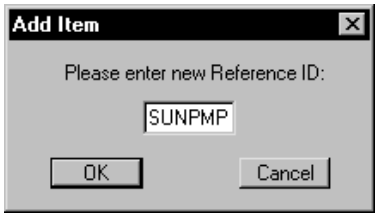
3 Expand Cost Libraries, Equipment Libraries, and either Inch-Pound or Metric. (If following the example provided, select Inch-Pound.)

4 Right-click on the library to which you want to add an item, and then click Modify on the pop-up menu.

5 Click **Add** on the Library dialog box.

6 Enter a Reference ID for the item in the **Add Item** dialog box.

The one- to six-character alphanumeric Reference ID uniquely identifies the library item being added. The ID is used to sort and search for library items. The first character must be a letter.

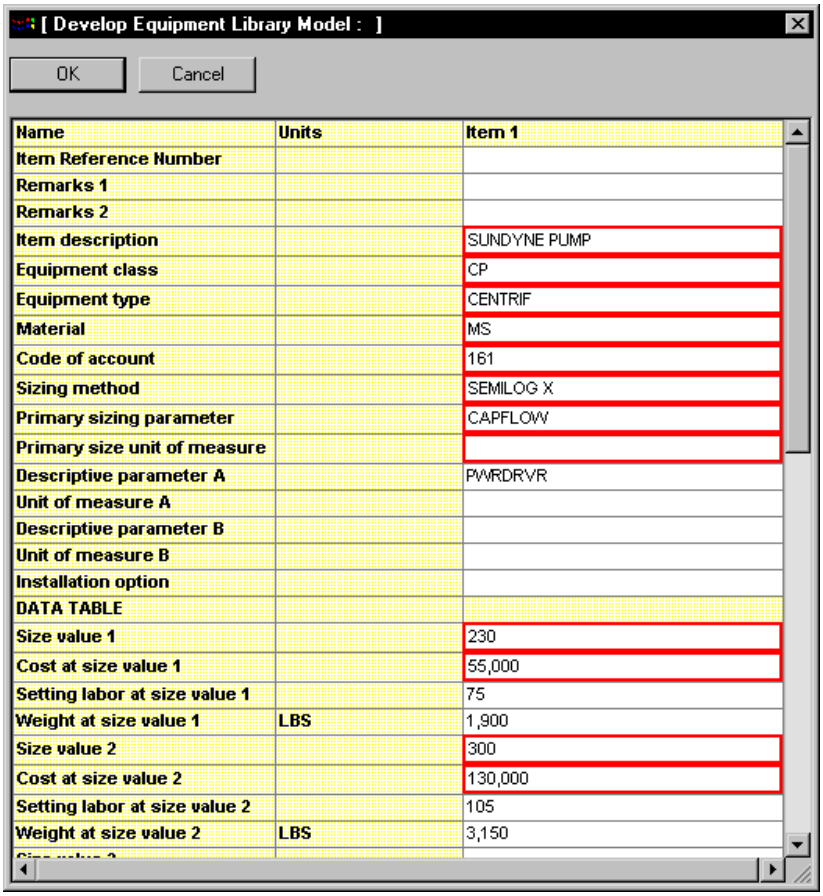


7 Click **OK**.

8 Enter the descriptive data for the item in the Develop Equipment Model Library form. If following the example, enter the data exactly as shown below. Be sure to correctly enter the sizing parameters, CAPFLOW and PWRDRVR; Aspen In-Plant Cost Estimator knows to use GPM (or L/S for METRIC) and HP, respectively, for these parameters.

The Data Table section provides fields for sizing and costing data. The Weight entered will be used to select and size the foundation, as well as to calculate loadings for OPEN-STEEL structures.

Sizing method: the data is in the form of either a continuous curve (linear, log-log or semi-log) or a set of discrete tabular values. When an equipment model library item is retrieved into a project, the specified size for the project component is used to develop the appropriate cost, man-hours and weight from the library data.



Name	Units	Item 1
Item Reference Number		
Remarks 1		
Remarks 2		
Item description		SUNDYNE PUMP
Equipment class		CP
Equipment type		CENTRIF
Material		MS
Code of account		161
Sizing method		SEMILOG X
Primary sizing parameter		CAPFLOW
Primary size unit of measure		
Descriptive parameter A		PWRDRVR
Unit of measure A		
Descriptive parameter B		
Unit of measure B		
Installation option		
DATA TABLE		
Size value 1		230
Cost at size value 1		55,000
Setting labor at size value 1		75
Weight at size value 1	LBS	1,900
Size value 2		300
Cost at size value 2		130,000
Setting labor at size value 2		105
Weight at size value 2	LBS	3,150

9 Click **OK** to save your specifications.

The new item appears on the Library dialog box, which you may now close.

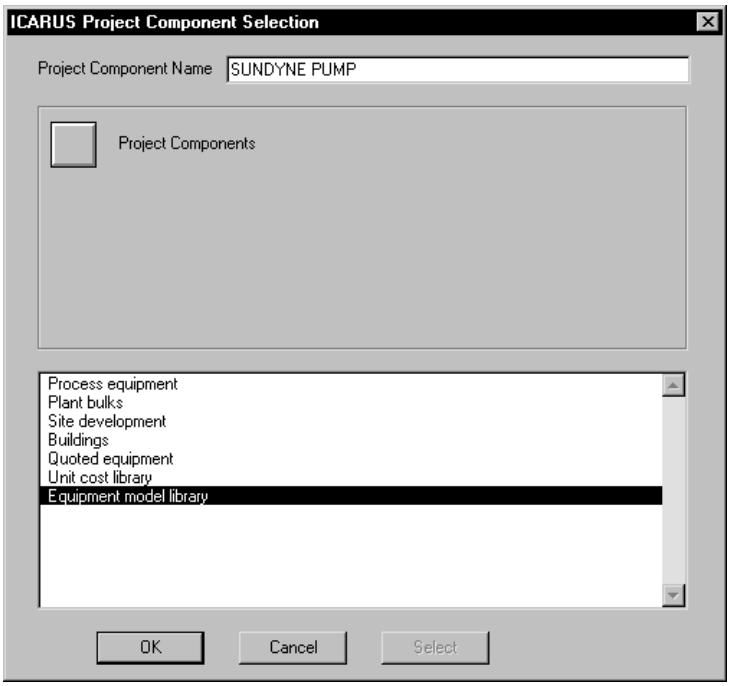
Adding an EML Item as a Project Component

To add an EML item as a project component:

1 Open the project to which you want to add the EML item. For the purposes of this example, you can use either an existing or newly created US/I-P based project.

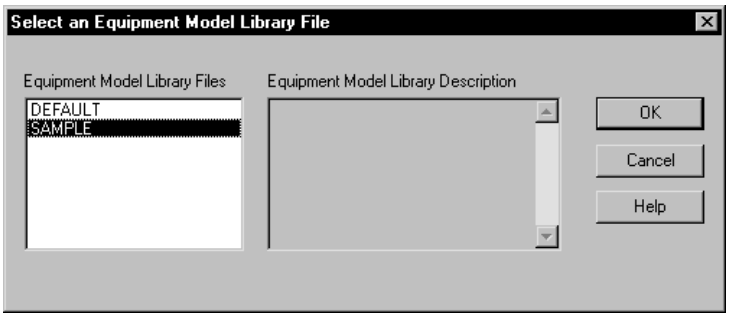
2 In Project Explorer (Project view), right-click on the area in which to add the EML item, and then click Add Project Component on the pop-up menu.

3 On the Icarus Project Component Selection dialog box, specify a project component name for the item.

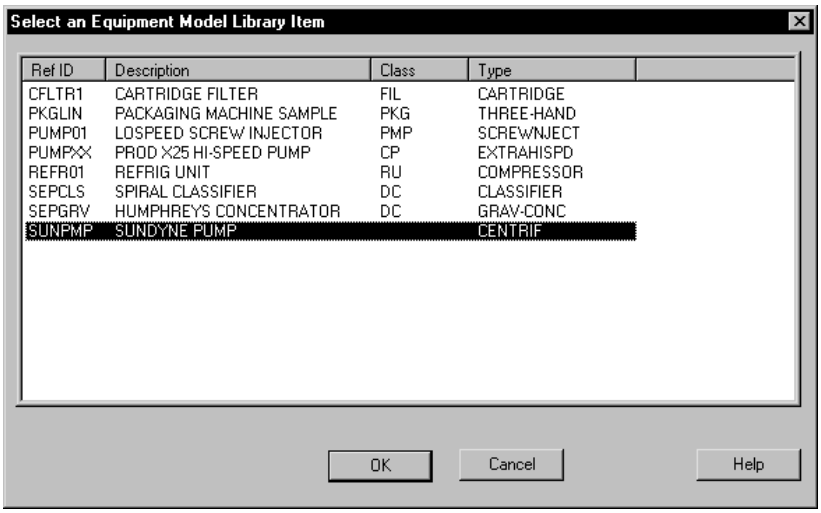


4 Select **Equipment Model Library** and click **OK**.

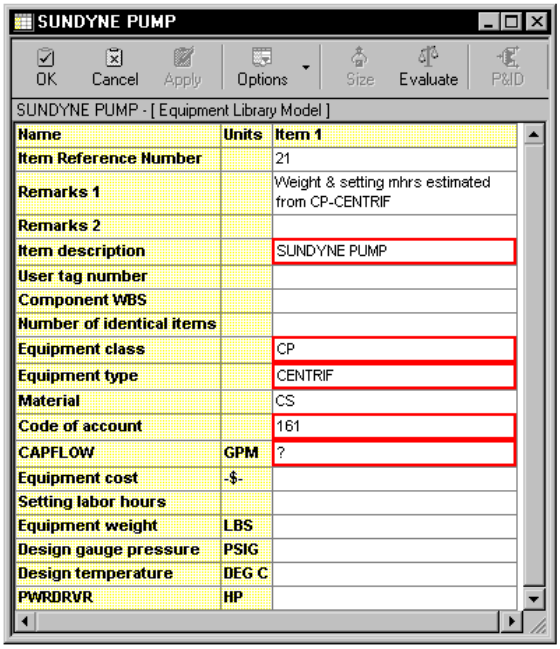
5 At the Select an Equipment Model Library File dialog box, select the EML to which you added the item and Click OK.



6 On the **Select an Equipment Model Library Item** dialog box, select the item you added and click **OK**.



7 Enter your specifications for the item at the Component Specifications form. Note that the Size parameters defined in the library are included on the form.



8 Click **OK** to apply and save the specifications.

The item will now be included in project evaluations.

Note: If you want to use sizing parameters with the EML, you must use one of the sizing parameter symbols listed below:

Symbol	Description
AREA	Heat Exchanger Area
AREAH	Area Height
AREAL	Area Length
AREAW	Area Width
CAP	Liquid Volume

CAPACITY	Liquid Volume
CAPFLOW	Liquid Flowrate
CAPREF	Refrigeration Capacity
DENS	Fluid Density
DENSITY	Fluid Density
DIA	Vessel Diameter
DIAMETER	Vessel Diameter
DIA1	Bottom Diameter
DIA2	Top Diameter
DTMP	Design Temperature
DTMP2	Alt Design Temperature
DUTY	Heat Transfer
FLOW2	Alt Gas Flow
FLOWRATE	Gas Flow
HEAD	Fluid Head
HEIGHT	Vessel T-T Height
HGT	Vessel T-T Height
HGT1	Bottom Height
HGT2	Top Height
JPRES	Jacket Pressure
LENGTH	Equipment Length
LTH	Equipment Length
MWGT	Molecular Weight
NITEMS	Multiple Items
POWER	Power
PRES	Pressure
PRES2	Alt Pressure
PRESSURE	Pressure
PWRDRVR	Power
RAT	Flow
SPGR	Specific Gravity
TMP	Temperature
TMP2	Alt Temperature
VISCOS	Viscosity
VOL	Gas or Solid Volume
VOLUME	Gas or Solid Volume
WIDTH	Equipment Width
WTH	Equipment Width

Developing and Using a Unit Cost Library (UCL)

The instructions below use as an example a library of asbestos abatement (ASBABT) costs and man-hours. This example has been selected because environmental remediation data is difficult to model, since costs and man-hours tend to vary greatly based on site conditions and project types. Items of a unique and/or variable nature are ideal for storing in a UCL.

The instructions take this example through the following stages: library creation, adding items to the library, adding a library item to a project as a component, and forming an assembly in the project out of multiple UCL items.

Creating a Unit Cost Library

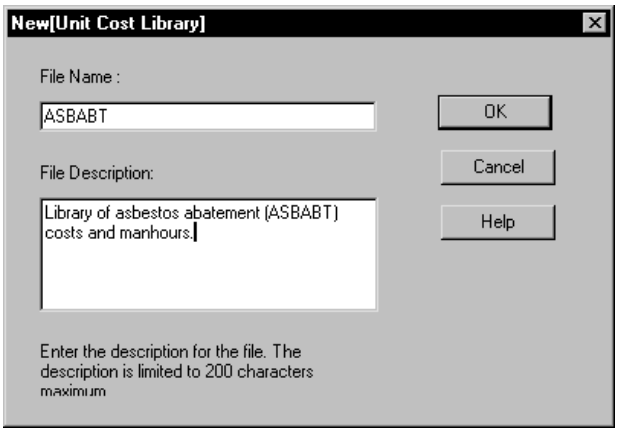
To create a unit cost library:

1 With no project open, go to the Palette's Libraries tab view. Expand Cost Libraries in the tree-structure, and then expand Unit Cost Library.

The libraries are divided into Inch-Pound and Metric.

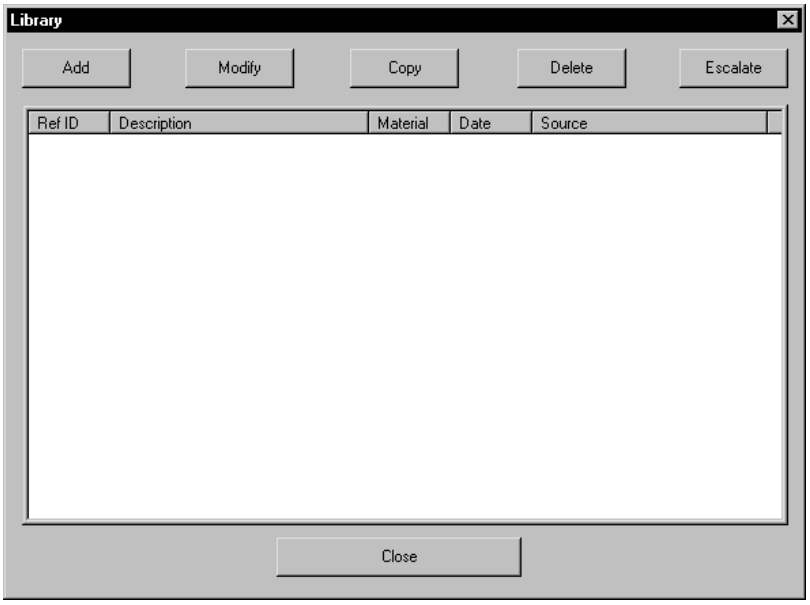
2 To create a library for use in projects with an Inch-Pound units of measure basis, as in the ASBABT example used in these instructions, right-click on Inch-Pound and click New on the pop-up menu.

3 In the New Unit Cost Library dialog box, enter a file name (required) for the UCL and a brief description (optional), as shown on the following page.



4 Click **OK** to create the new UCL.

An empty Library dialog box appears.



You can now add items to the new UCL.

Adding an Item to a UCL

To add items to a UCL:

1 If you just added a library, the Library dialog box is displayed, and you can skip to Step 2. If not, follow these steps:

a Go to the Palette's Libraries tab view.

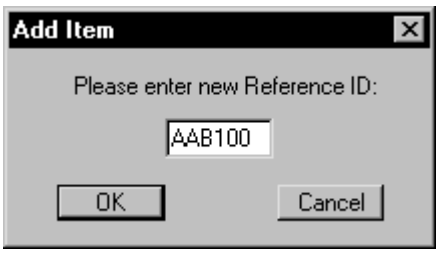
b Expand Cost Libraries, Unit Cost Libraries, and either Inch-Pound or Metric.

c Right-click on the library to which you want to add an item, and then click Modify on the pop-up menu.

2 Click Add on the Library dialog box.

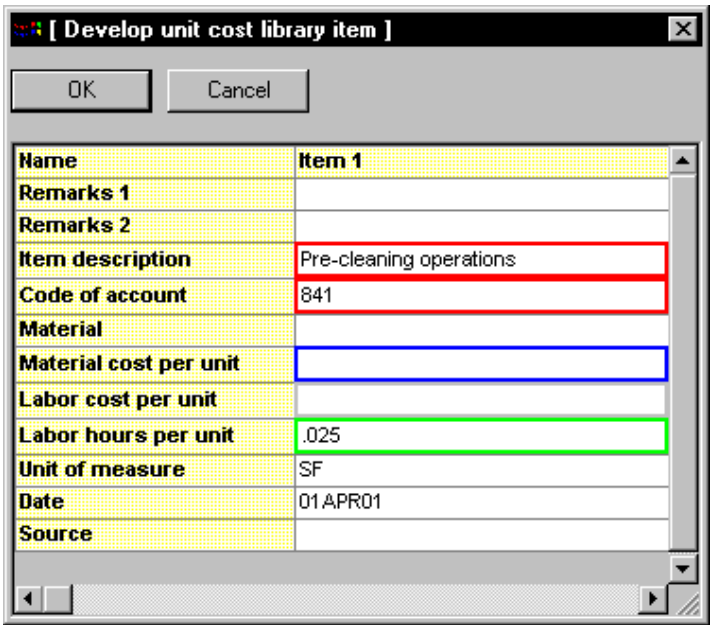
3 Enter a Reference ID for the item in the Add Item dialog box.

The one- to six-character alphanumeric Reference ID uniquely identifies the library item being added. The ID is used to sort and search for library items. The first character must be a letter.



4 Click **OK**.

5 In the Develop Unit Cost Library form, enter information for the new item.



Note: Costs are allocated to the specified Code of Account (COA). The COA used in the example is not defined by Aspen In-Plant Cost Estimator. You must either define this COA (see instructions under "Code of Accounts," page **Error! Bookmark not defined.**) or use another COA.

Aspen In-Plant Cost Estimator uses the Material Cost Per Unit and Labor Cost Per Unit to cost the item in an estimate. If Labor Hours Per Unit is specified and Labor Cost Per Unit is left blank, Aspen In-Plant Cost Estimator will calculate the labor cost using the project wage rates at the time of the estimate.

The Unit of Measure can be designated for "each" or by any appropriate unit (i.e., "1000 SF"). Be sure to sufficiently describe the item so that you know what the unit costs include when the item is retrieved at some future date. The quantity is entered when the library item is retrieved into a project.

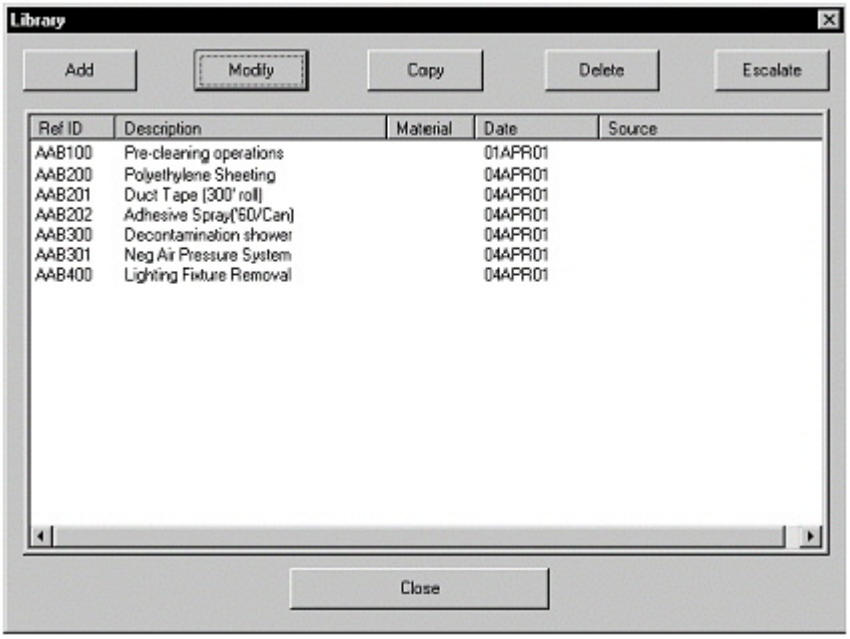
The Date and Source are for your reference and are not transferred into an estimate.

6 When done entering specifications for the item, click OK.

To add a set of items as in the ASBABT example, repeat the process (Steps 3-5) to add the following items in addition to the one shown in the previous graphic.

Reference No.	Item Description	Code of Account	Labor Cost Per Unit	Unit of Measure	Date of quotation
AAB200	Polyethylene Sheeting	841	.004	SF	04APR01
AAB201	Duct Tape (300' roll)	841		ROLL	04APR01
AAB202	Adhesive Spray (60' / can)	841		CAN	04APR01
AAB300	Decontamination Shower	841	2	EACH	04APR01
AAB301	Neg Air Pressure System	841	2	EACH	04APR01
AAB400	Lighting Fixture Removal	841	.01	EACH	04APR01

After the above are added, the Library dialog box will appear as shown below.



7 When done adding items to the UCL, click **Close** on the **Library** dialog box.

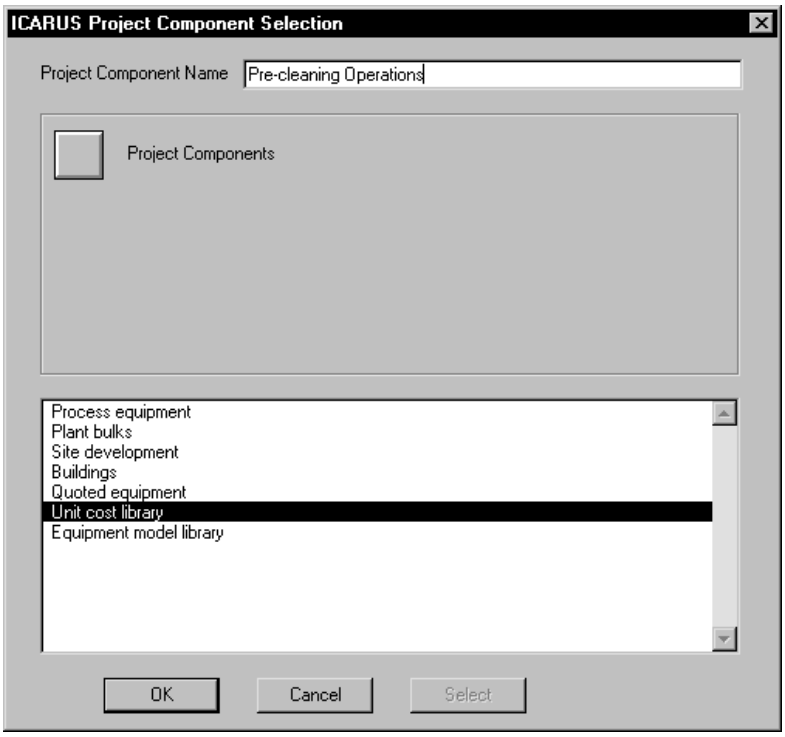
Adding a UCL Item to a Project

To add a single UCL item to a project:

1 Open the project to which you want to add the UCL item. To add an item from the ASBABT library developed as an example in the previous instructions, you can open either an existing or newly created US/I-P based project.

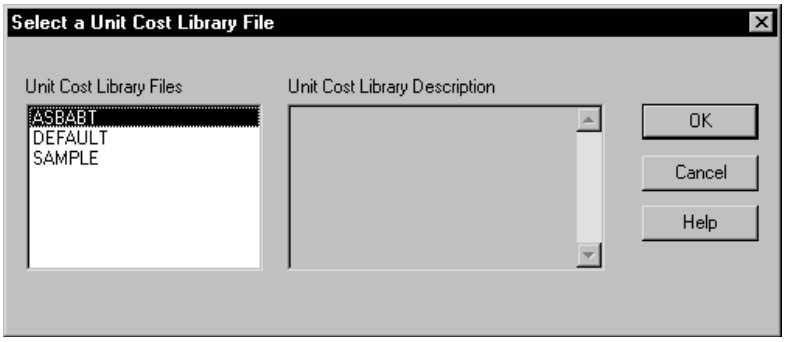
2 In Project Explorer (Project view), right-click on the area in which to add the UCL item, and then click Add Project Component on the pop-up menu.

3 On the Icarus Project Component Selection dialog box, specify a project component name for the item.

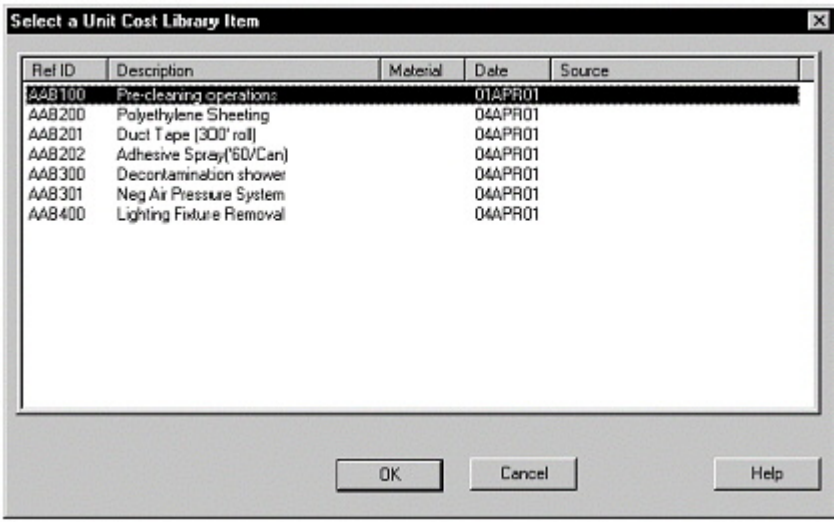


4 Select **Unit Cost Library** and click **OK**.

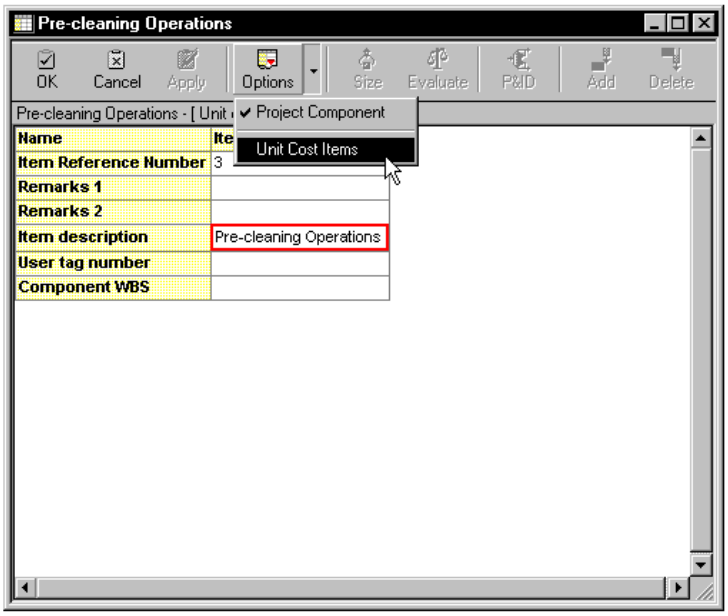
5 On the **Select a Unit Cost Library File** dialog box, select the UCL to which you added the item and click **OK**.



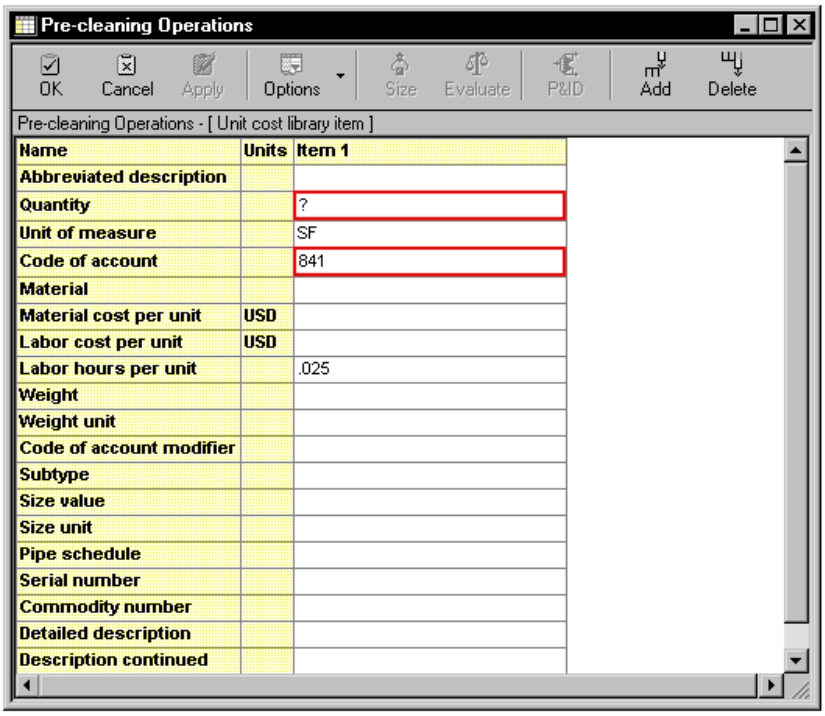
6 On the Select a Unit Cost Library Item dialog box, select the item you added and click **OK**.



7 On the **Component Specifications** form, click the **Option** drop-down button and click **Unit Cost Item**s.



Aspen In-Plant Cost Estimator retrieves the unit cost data you set up in Libraries.



You can now enter the quantity data and modify any of the retrieved data.

8 Click **OK** to save the specifications and close the form.

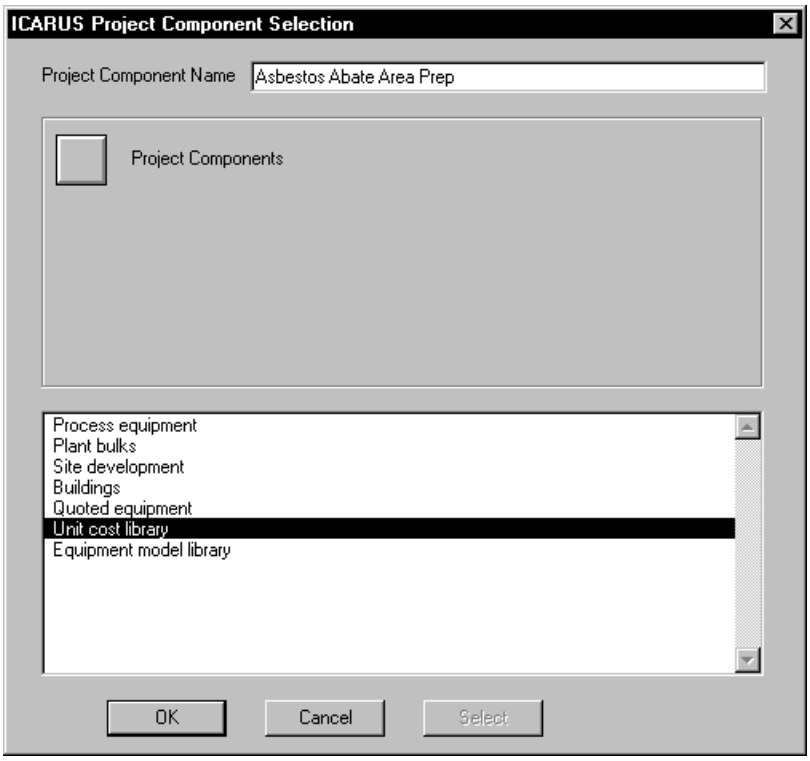
Creating an Assembly of UCL Items

This section shows how to add several items from the library to form an assembly. In the example, the items from the ASBABT library are added to form an Asbestos Abatement Area Preparation Assembly.

To create an assembly of UCL items in a project:

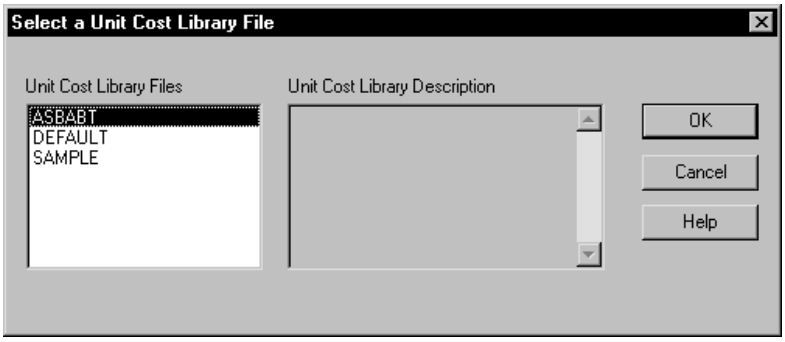
1 In Project Explorer (Project view), right-click on the area in which to add the UCL item, and then click Add Project Component on the pop-up menu.

2 On the Icarus Project Component Selection dialog box, enter as the project component name a description of the assembly.

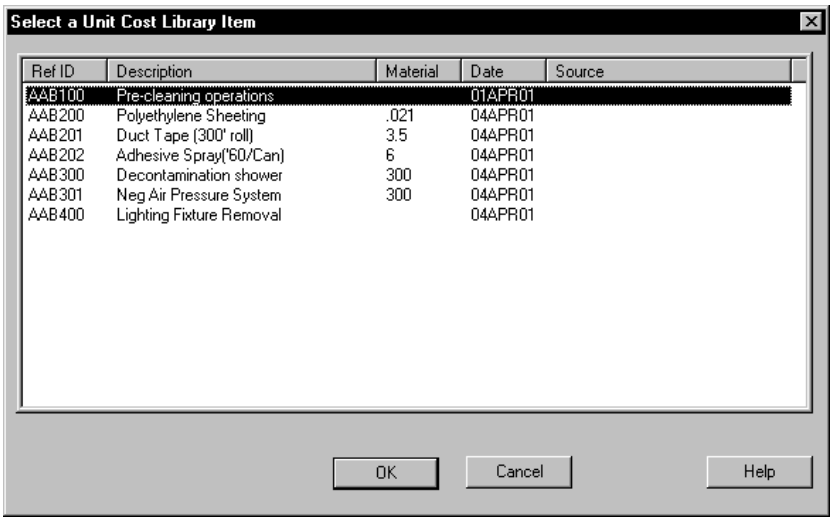


3 Click **Unit Cost Library** and click **OK**.

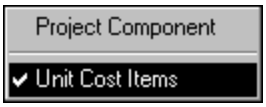
4 At the **Select a Unit Cost Library File** dialog box, select the UCL containing the first item to add to the assembly and click **OK**.



5 At the **Select a Unit Cost Library Item** dialog box, select the first item to add to the assembly and click **OK**.

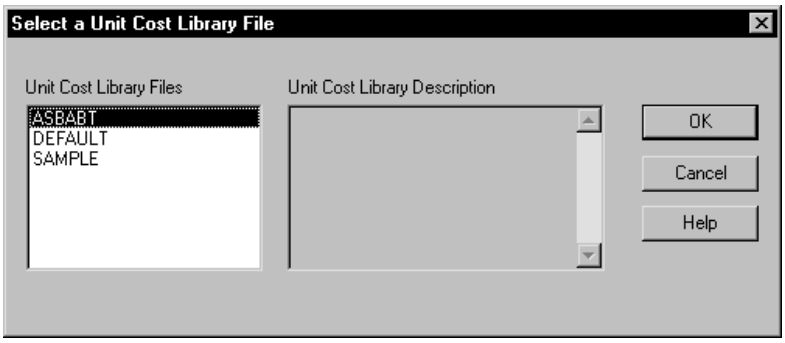


6 On the **Component Specifications** form, click the **Option** drop-down button and select **Unit Cost Items**.

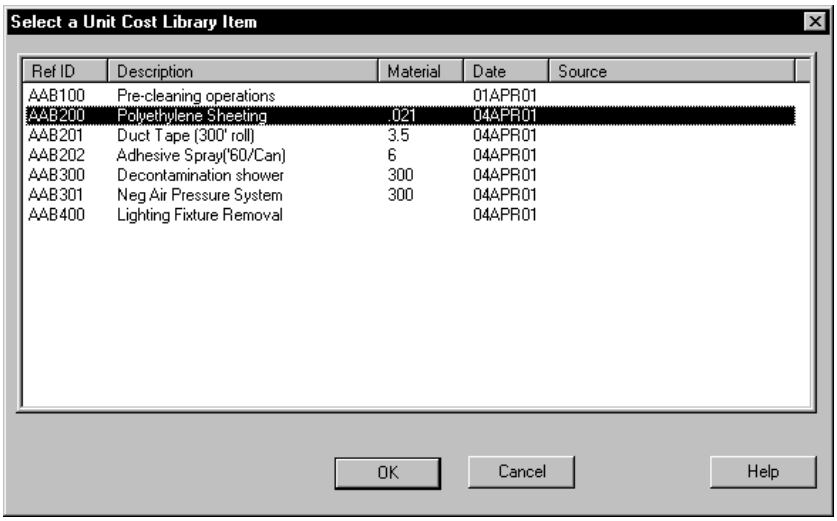


7 Click **Add**.

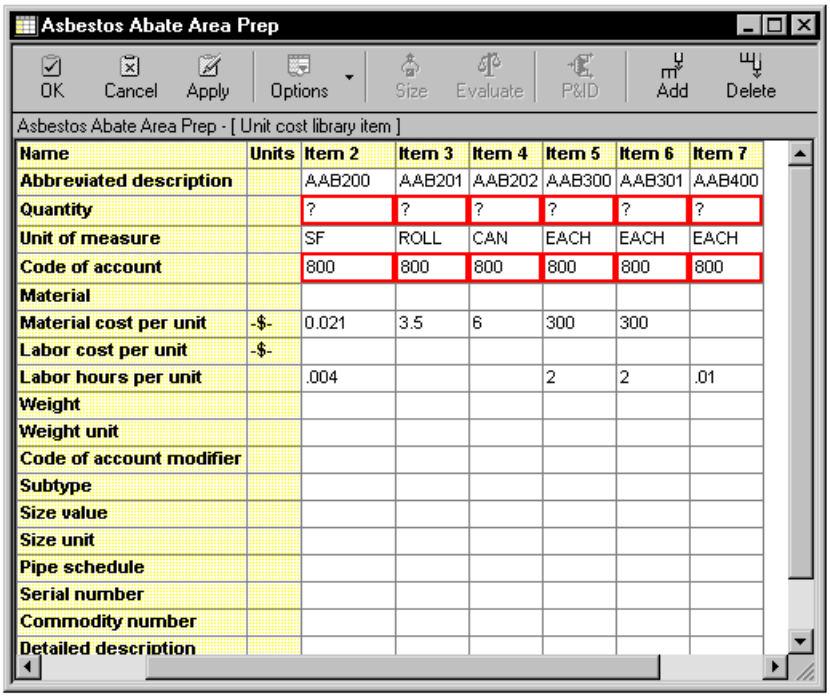
8 On the **Select a Unit Cost Library File** dialog box, select the UCL containing the next item to add to the assembly and click **OK**.



9 On the **Select a Unit Cost Library Item** dialog box, select the next item to add to the assembly and click **OK**.



10 Repeat the process of adding items until the form contains columns for all the items in the assembly.



Name	Units	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7
Abbreviated description		AAB200	AAB201	AAB202	AAB300	AAB301	AAB400
Quantity		?	?	?	?	?	?
Unit of measure		SF	ROLL	CAN	EACH	EACH	EACH
Code of account		800	800	800	800	800	800
Material							
Material cost per unit	-$-	0.021	3.5	6	300	300	
Labor cost per unit	-$-						
Labor hours per unit		.004			2	2	.01
Weight							
Weight unit							
Code of account modifier							
Subtype							
Size value							
Size unit							
Pipe schedule							
Serial number							
Commodity number							
Detailed description							

11 After entering quantities for the items click **OK**.

The assembly is listed as one project component on the Project Explorer (Project view) and the List view.

You can now run an evaluation on the item (see page 270 for instructions). An Item Report would summarize total costs and man-hours, as well as list each assembly item's costs and man-hours.

Working with Cost Libraries

Equipment model and unit cost libraries share the functions described in this section.

Copying a Library Item

When adding a library item similar to one that already exists, it is easier to copy the existing library item and modify the necessary specifications.

To copy a library item:

1. Highlight a library item in the Library dialog box and click **Copy**.
2. Enter a Reference ID for the new item.

   The one- to six-character alphanumeric Reference ID uniquely identifies the library item being added. The ID is used to sort and search for library items. The first character must be a letter.
3. Click **OK**. Aspen In-Plant Cost Estimator adds the new item with all the same data as the original — only the Reference ID has changed.

Deleting a Library Item

When a library item is no longer useful, it can be removed from the library file.

To delete a library item:

1. Highlight a library item in the Library dialog box and click Delete.

A dialog box appears to confirm the delete.

2. Click **Yes** to delete the selected library item.

   -or-

   Click **No** to retain the library item in the library file.

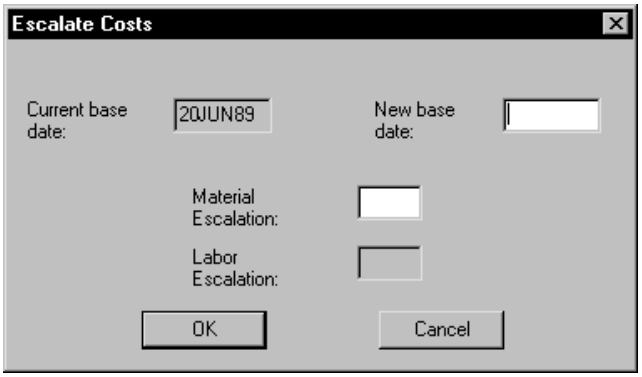
Escalating Library Costs

Library items contain costs which change over time due to inflation. Escalating library costs bring the library costs up to date.

To escalate library costs:

1. Click **Escalate** on the **Library** dialog box.

The **Escalate Costs** dialog box appears.



2 Enter the escalation specifications.

In this field	type
New Base Date:	The date of escalation or the date at which the prices are current.
Material Escalation:	Amount by which to escalate material costs.
Labor Escalation:	Amount by which to escalate labor costs. Since equipment model libraries only include setting man-hours, not labor costs, this field only appears when escalating unit cost libraries.

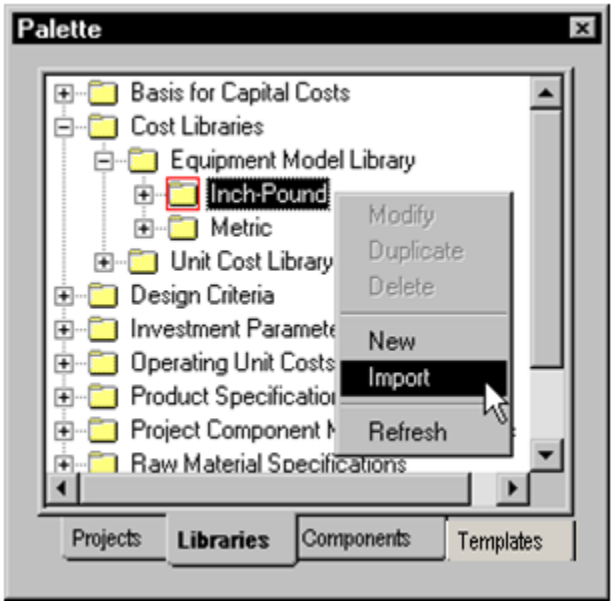
3 Click **OK** to escalate all the library items in the library file.

Importing a Cost Library

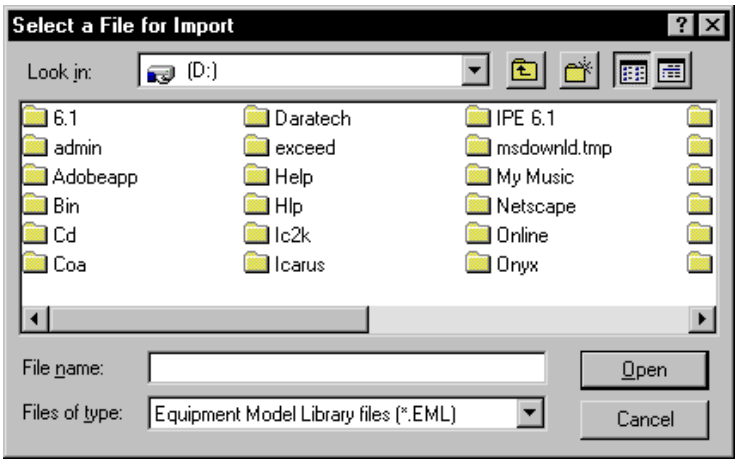
You can import UCL files, which have the extension ".LIB", and EML files, which have the extension ".EML", from elsewhere on your computer or network.

To import a cost library:

1 In the Palette (**Libraries** view), right-click on the appropriate Units of Measure basis (**Inch-Pound** or **Metric**), and then click **Import** on the pop-up menu.



2 In the **Select a File for Import** window, locate the file and then click **Open**.



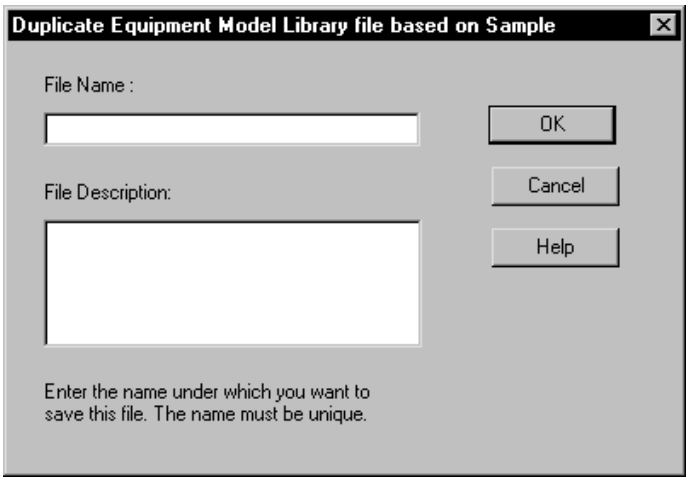
The file is now included in the Palette and its items can be added as IPE project components.

Duplicating a Cost Library

To duplicate a cost library:

1 In the Palette (**Libraries** view), right-click on the library you wish to duplicate, and then click **Duplicate** on the pop-up menu.

2 Enter a file name and description (optional) for the new library.


Duplicate Equipment Model Library file based on Sample
File Name :
OK
Cancel
File Description:
Help
Enter the name under which you want to save this file. The name must be unique.

Aspen In-Plant Cost Estimator displays the Library dialog box for the new Library, which contains the same items as the original. You can add, modify, or delete the items without affecting the original.

Deleting a Cost Library

To delete a cost library:

- In the Palette (**Libraries** view), right-click on the library to be deleted, and then click **Delete** on the pop-up menu.

Accessing External Unit Cost Data

The features in Aspen Icarus for accessing external unit cost data allow data access from either Richardson's WinRace software or a user's third party data source. This data can be used in Aspen Icarus as Unit Cost Library (UCL) items.

Accessing Richardson's WinRace Database Data

To access unit cost data from Richardson's WinRace database, you must install and configure a licensed copy of the WinRace software, and then select the desired unit cost line items from the WinRace database.

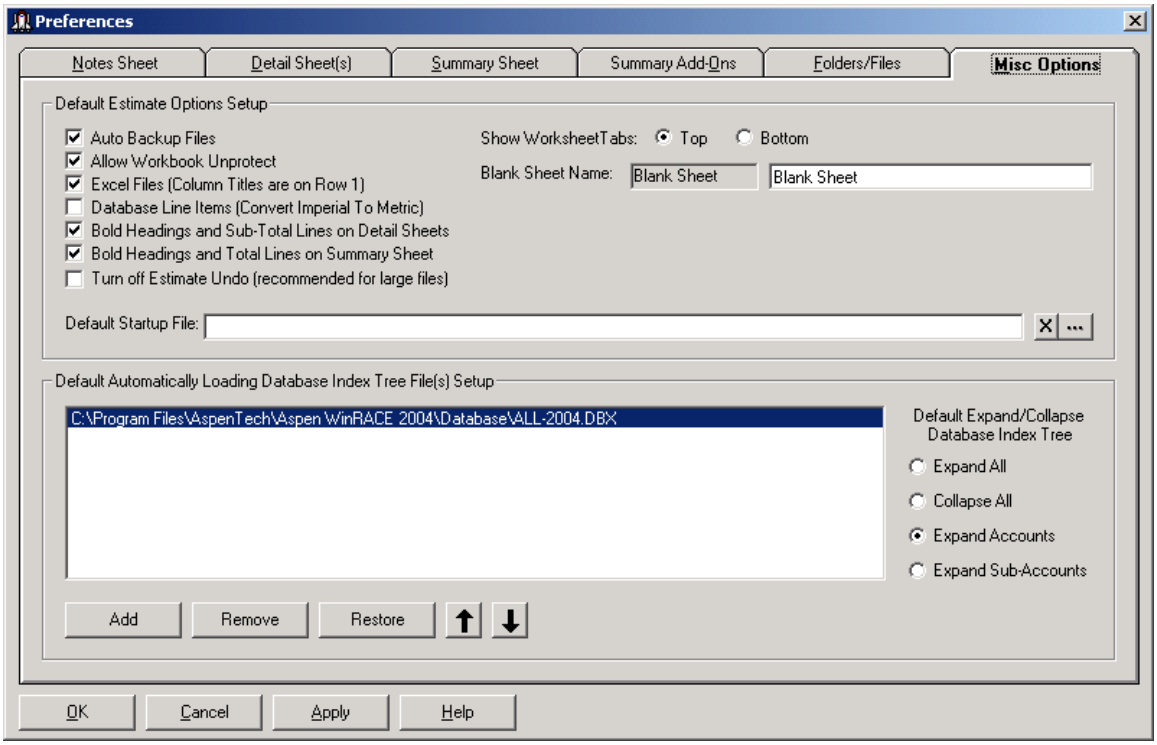
Setting Up Access to Richardson's WinRace Database Data

Install Richardson's WinRace software (for more detailed instructions please refer to the Richardson's WinRace Installation Guide).

Note: Using the WinRace database data requires a valid WinRace license.

Configuring a default database data file to load in WinRace

1. Start WinRace.
2. Select the **Preferences** menu.
3. Click on the **Misc Options** Tab. In the **Default Automatically Loading Database Index Tree File(s) Setup** pane, configure the desired dataset to be visible when accessing the data.
4. Click the **Add** button and select the desired data set.

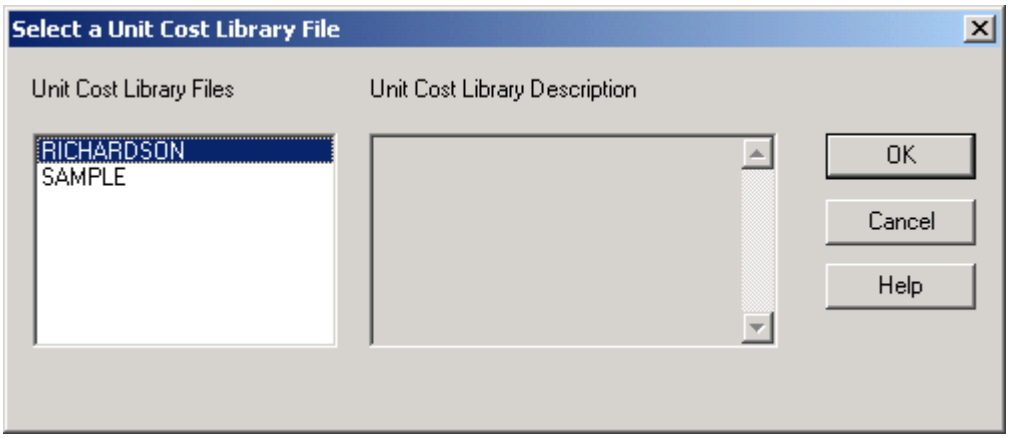


The **ALL-20XX.DBX** data set is the largest most comprehensive set but if only part of the data is of interest, you can select any of the smaller database sets or new ones created by the user. WinRace includes features for creating customized data sets from the WinRace database or creating user-created data sets. See the WinRace help for more information.

Selecting Unit Cost Line Items from the WinRace Database

Unit cost line items from the WinRace database can be added to existing UCL item project components or when creating a new UCL item project component.

1. Follow the steps from the **Adding a UCL Item to a Project** section.
2. If WinRace is installed, you will have a new RICHARDSON choice on the Select a Unit Cost Library File dialog box. Select **RICHARDSON** as the Unit Cost Library file.

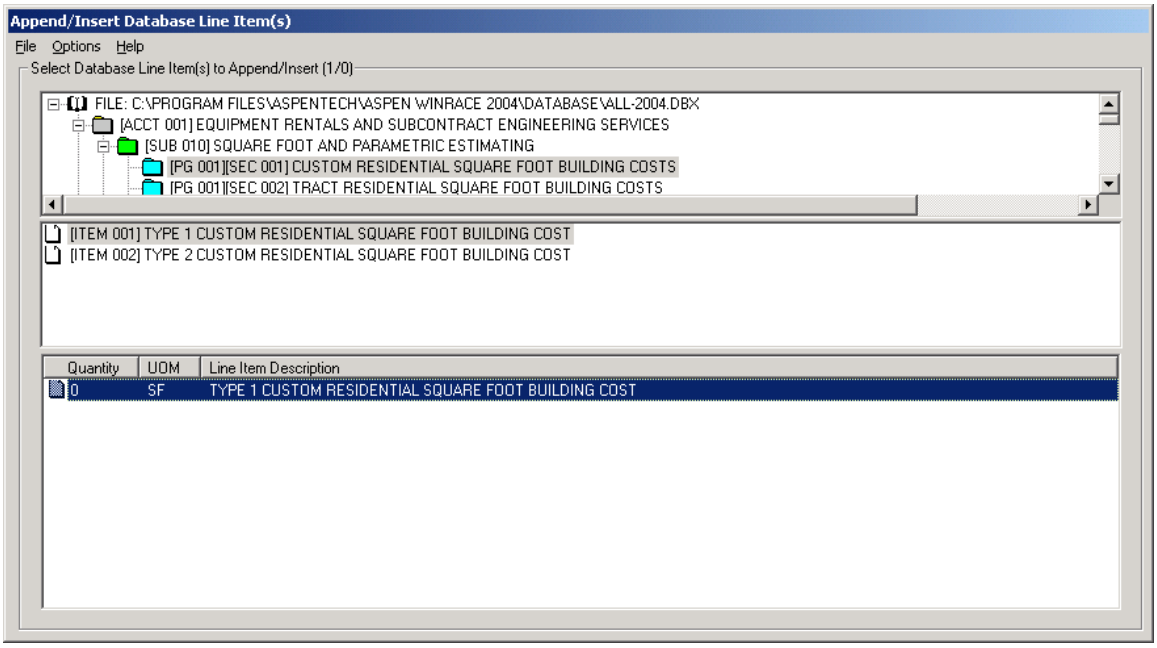


3 Click **OK**.

The **Append/Insert Database Line Items(s)** dialog appears. On this dialog, you will select the desired unit cost line items to be transferred back to the Aspen Icarus UCL item.

4 In the top pane, select one of the database sections (1). This will show the line item choices in this section in the middle pane (2).

5 Double-click on one or more of the items in the middle pane to add this to the bottom pane which contains the list of items that will be transferred back to Aspen Icarus.


Append/Insert Database Line Item(s)
File Options Help
Select Database Line Item(s) to Append/Insert (1/0)
FILE: C:\PROGRAM FILES\ASPENTECH\ASPEN WINRACE 2004\DATABASE\ALL-2004.DBX
[ACCT 001] EQUIPMENT RENTALS AND SUBCONTRACT ENGINEERING SERVICES
[SUB 010] SQUARE FOOT AND PARAMETRIC ESTIMATING
[PG 001][SEC 001] CUSTOM RESIDENTIAL SQUARE FOOT BUILDING COSTS
[PG 001][SEC 002] TRACT RESIDENTIAL SQUARE FOOT BUILDING COSTS
[ITEM 001] TYPE 1 CUSTOM RESIDENTIAL SQUARE FOOT BUILDING COST
[ITEM 002] TYPE 2 CUSTOM RESIDENTIAL SQUARE FOOT BUILDING COST
Quantity
UOM
Line Item Description
0
SF
TYPE 1 CUSTOM RESIDENTIAL SQUARE FOOT BUILDING COST

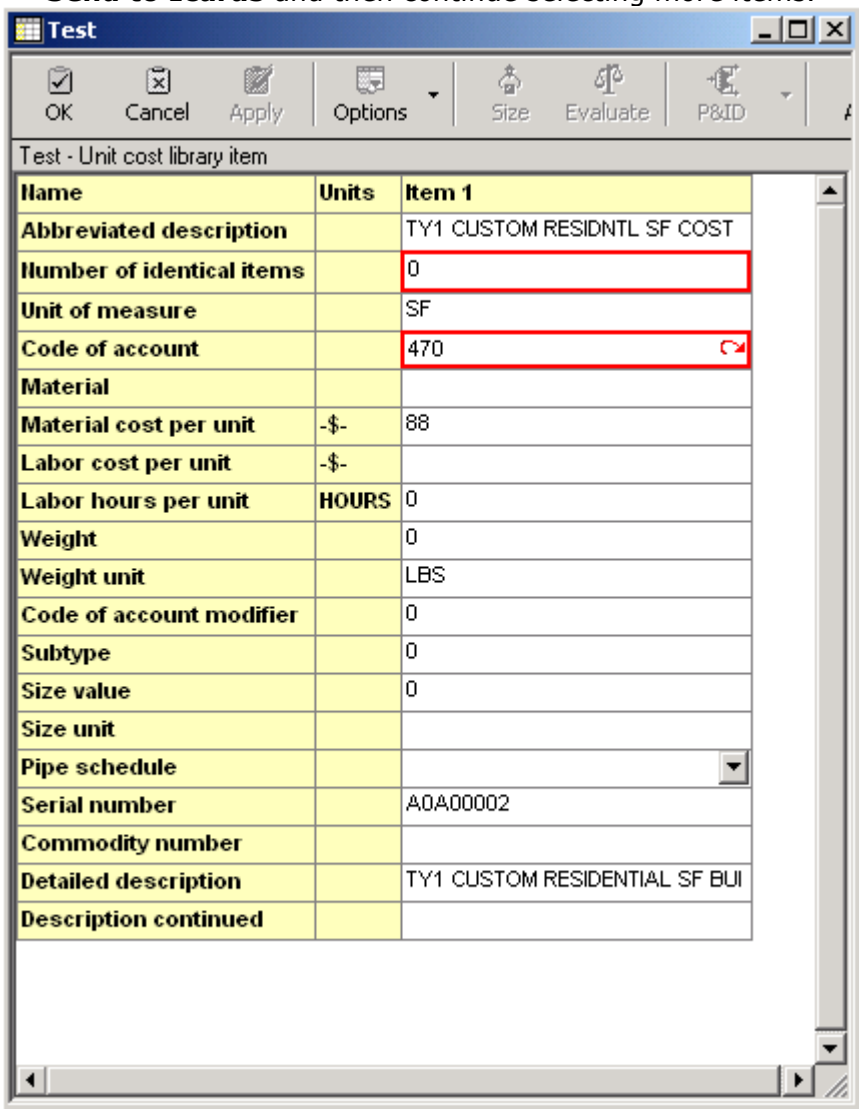
6 Proceed with this method of adding multiple items to the bottom pane to build up an assembly in one pass.

Right-clicking on an item in any pane and selecting **View Book Line Item** (or pressing F7) will open and display the page where this item is described in the Richardson Process Plant Construction Estimating Manual.

Right-clicking on an item in the middle or bottom pane and selecting **View Index/Line Item Details** will display the data in the database that will be used to fill out the UCL Item line item in Aspen Icarus.

For more information on all the features and functionality of this dialog, see the WinRace help.

7 When you have completed the list of items you want to send to Aspen Icarus, go to the **Options** menu and select **Send to Icarus and Close**. This closes the WinRace dialog. If you want to add more items, select **Send to Icarus** and then continue selecting more items.



Name	Units	Item 1
Abbreviated description		TY1 CUSTOM RESIDNTL SF COST
Number of identical items		0
Unit of measure		SF
Code of account		470
Material		
Material cost per unit	-$-	88
Labor cost per unit	-$-	
Labor hours per unit	HOURS	0
Weight		0
Weight unit		LBS
Code of account modifier		0
Subtype		0
Size value		0
Size unit		
Pipe schedule		
Serial number		A0A00002
Commodity number		
Detailed description		TY1 CUSTOM RESIDENTIAL SF BUI
Description continued		

8 From the Icarus **Options** menu, select **Unit Cost Items** to see the data transferred from WinRace. You will need to enter the quantity for this item by updating the **Number of Identical Items** field.

Accessing User Unit Cost Data

To access unit cost data from a user's existing third-party data source, you need to set up a named data source pointing to a copy of the user's converted data. This data is mapped to a structure that the tools in Aspen Icarus and Richardson can access. The desired unit cost line items from the WinRace database can then be selected.

To access unit cost data from a user's existing third-party data:

1. Export the required data from the user's source into a dbf (Dbase III) format.
2. Install Richardson's WinRace software to use as a database navigator and selector.
3. Map the user's data to a field structure that WinRace can understand using tools provided.

Requirements for Accessing User Unit Cost Data

Obtain a copy of the user unit cost data in a flat single table dbf (Dbase III or Dbase IV) format (for example, UserDataInUserStructure.dbf). It is highly recommended that the data contain the following data fields:

- An accounting code field
- A description field
- Unit of measure field which indicates the basis for the unit cost/hours
- A material cost field
- A labor hours field

Install Richardson's WinRace software. For detailed instructions, see the Richardson's WinRace Installation Guide. A WinRace license is NOT needed to access your own data through the Aspen Icarus user unit cost data link.

An Example Database File can be Created from an Excel File

Any program that can create a DBaseIII (dbf) file can be used to create a unit cost data file. Excel data is an example of an external data source that can be used to generate the source data for a link to user's unit cost data. There are a few tips in getting Excel to generate a properly structured dbf file:

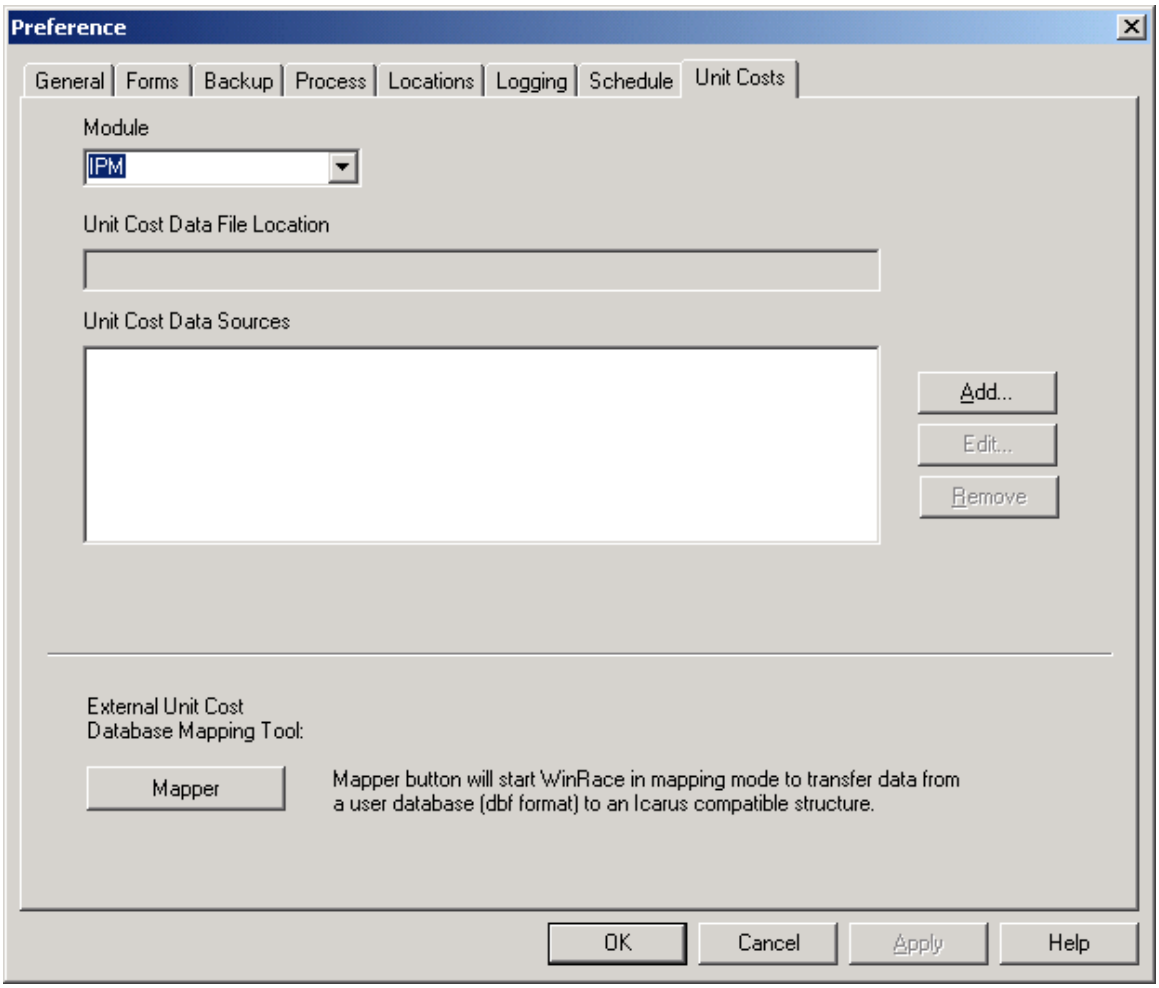
- Use a header/title line to provide the field names to each of the columns.
- On each column, set the **Width** to the number of characters/digits to control the format for each field. This prevents truncation of column data and errors when mapping about invalid field width/format.
- Use the **named range** feature to define the columns and rows that will be exported into the dbf file.
- Select all data columns and rows (including the header/title row).
- Select **Insert – Name – Defined** and create a range called **Database**. This step is required so that when you do a File – **Save As** and change the file type to Dbase IV (.dbf), it will be able to determine which columns and rows should be stored in the file.

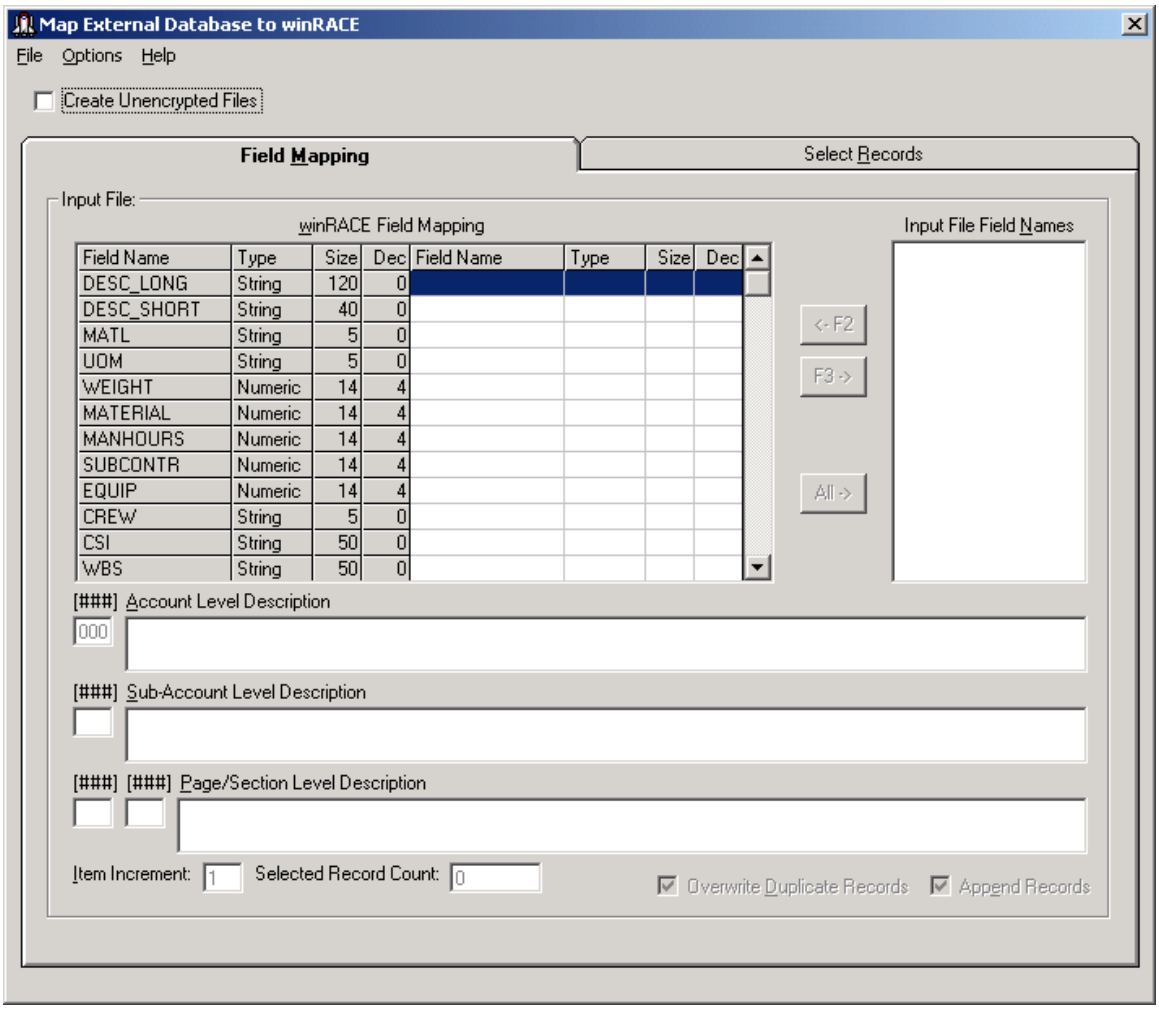
Creating a Database File in Aspen Icarus/WinRace Format

Since user unit cost data can have more or less data than Aspen Icarus or WinRace would usually expect and the data is in user named and formatted fields, the data must be mapped into a known database structure. Also, WinRace has important features for simplifying navigation of the data.

To map the data from the user dbf file to a WinRace dbf and dbx (index) file:

1. Open Aspen Icarus.
2. Go to the **Tools** menu.
3. Select **Preferences** and go to the **Unit Costs** tab.
4. Click the **Mapper** button. This will display the Map External Database to WinRace dialog.





In this dialog, we will associate the fields in the user database file to the fields in a WinRace database formatted file.

5 Open the user database file.

6 From the **File** menu, select **Open.**

7 Select the user database file. The Input File Field Names pane will be populated with the list of fields in the user database.

8 Select a field that will need to be transferred to Icarus in the Input File Field Names pane.

9 Select the field where this data will be stored in the WinRace database file (in the WinRace Field Mapping pane).

10 Press **F2**. The type of these fields must be consistent and the source field must be the same or shorter in length than the WinRace field. Repeat this for all the fields that will be transferred to Icarus. See the table below for the list of fields that can be transferred to Icarus, data placed in any other field will not be used in the transfer.

WinRace Field	Field Type and Length	Unit Cost Item Description
ICACOA	**Numeric – 4**	**Code of Account**

ITEMDES	**String – 28**	**Item Description**
UOM	**String – 5**	**Per Unit of Measure**
MATERIAL	**Numeric – 14**	**Unit Material Cost**
MANHOURS	**Numeric – 14**	**Unit ManHours**
MATL	**String – 5**	**Material of Construction**
WEIGHT	**Numeric – 14**	**Unit Weight**
COAMOD	**Numeric – 2**	**Code for Icarus Reporting to qualify COA**
SUBTYPE	**Numeric – 3**	**Code for Icarus Reporting to qualify description**
SIZE	**Numeric – 8**	**Size or Diameter for sized based reporting**
SIZE UNIT	**String – 8**	**Unit of Measure of the Size field**
SCHCLASS	**String – 4**	**Schedule or Class**
SERIALNUM	**String – 8**	**Unique serial number for future use**
DESC_SHORT	**String – 40**	**Longer Unit Cost Item Description for input form**

For this first example, we will ignore the ability to separate the line items into sub-groups.

11 Enter a default description in each entry in the bottom section and enter 001 in all the ### fields.

12 Go to the **Select** tab and select all the line items.

To generate the file with data mapped into the correct field:

1 Select the Field Mapping Dialog and check Create Un-encrypted File at the top.

2 Select **File – Save**, and then browse to a location to store the file and provide a file name (for example, UserDataInWinRaceStructure.dbf).

Navigating by Sub-groups/Trees

Optionally you can simplify navigating your data by breaking down the line items into sub-groups that will be shown as a tree when adding an item to the project. By entering descriptions and numeric keys in the section at the bottom of the dialog, you can create the tree structure displayed in the dialog for finding and selecting the items when adding items to a project. You can create 1 or 2 levels of sub-groups within your list of items.

1 Enter values in the ### fields that when combined are unique and provide the description for each sub-group that will be visible in the interface.

2 Go to the **Select Records** tab and select the line items that will go in the first defined sub-group.

3 Select **File – Save**, and then browse to a location to store the file and provide the file name.

4 Select the next set of items on the **Select Records** tab, change the description and ### fields.

5 Select **File – Save** and point to the same file created in the last pass

6 Repeat this for every sub-group you want to define.

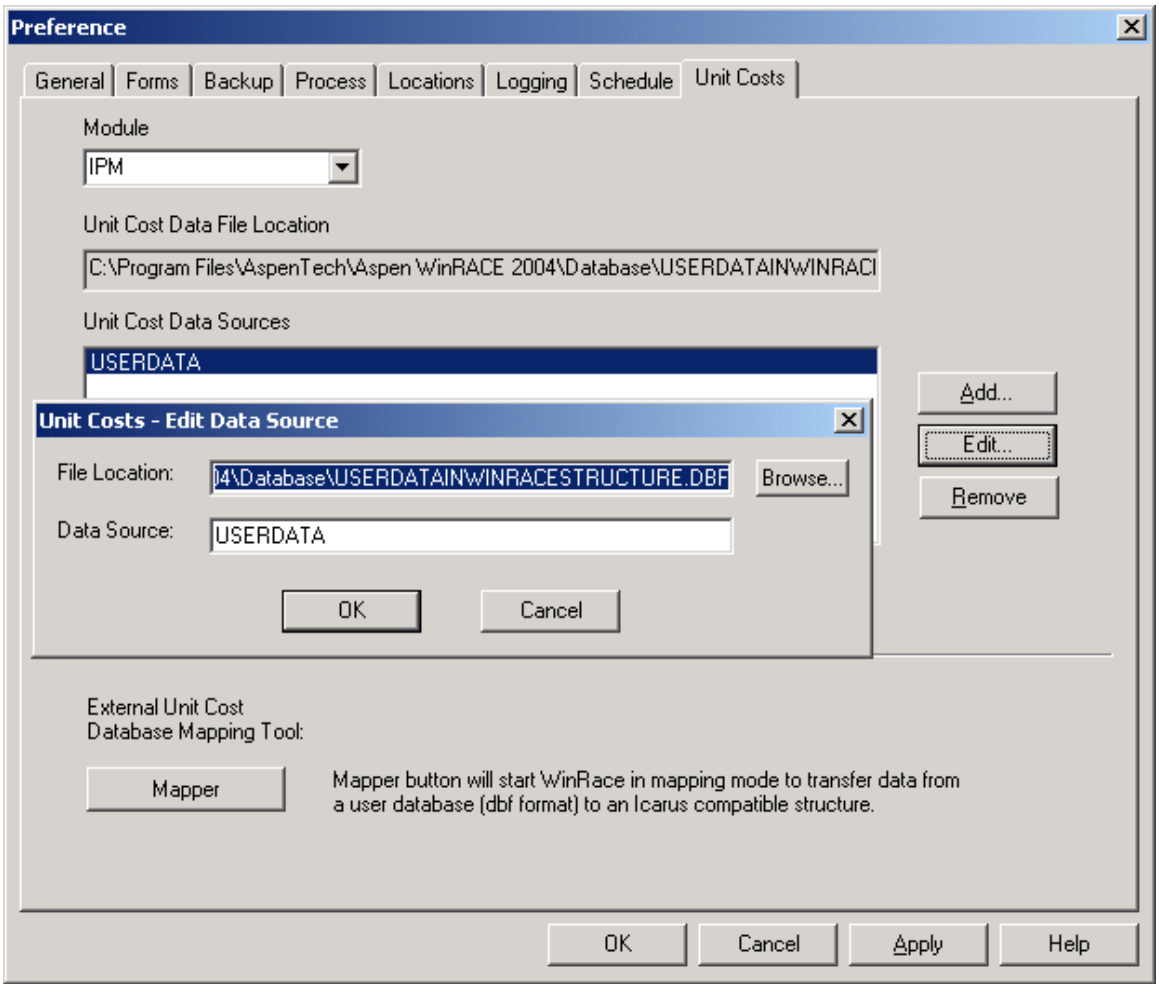
Setting Up Access to User Unit Cost Data

The last phase of setting up access to user data is to define the Unit Cost Data Source definition to be used when adding items to your project. This is a logical reference to the database you created in the previous step.

1 On the **Unit Costs** tab (under Tools – Preferences in the Aspen Icarus interface), click the **Add** button.

2 For the File Location entry, browse to the file created in the last step (i.e., UserDataInWinRaceStructure.dbf).

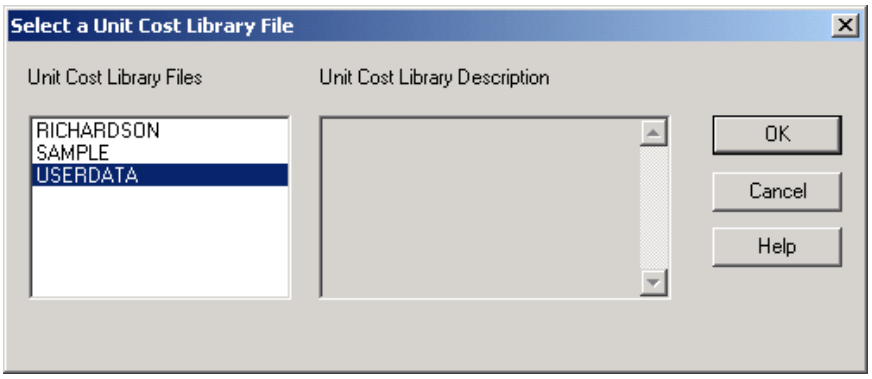
3 Enter a short name (for example, USERDATA) that will be shown when you are selecting the library where you will retrieve data for the unit cost library item.



You can set up multiple databases and multiple Unit Cost Data Sources by repeating these two steps.

Selecting Unit Cost Line Items

Selecting items will follow the same steps detailed previously for selecting unit cost line items from the WinRace database (see previous section). The only change is that a new option will be available on the Select a Unit Cost Library dialog with the Data Source name defined in the previous step.



7 Evaluating the Project

Running a Project Evaluation

After you have defined the project basis and project components, you are ready to run a project evaluation. The project evaluation produces capital costs, design, and graphical reports.

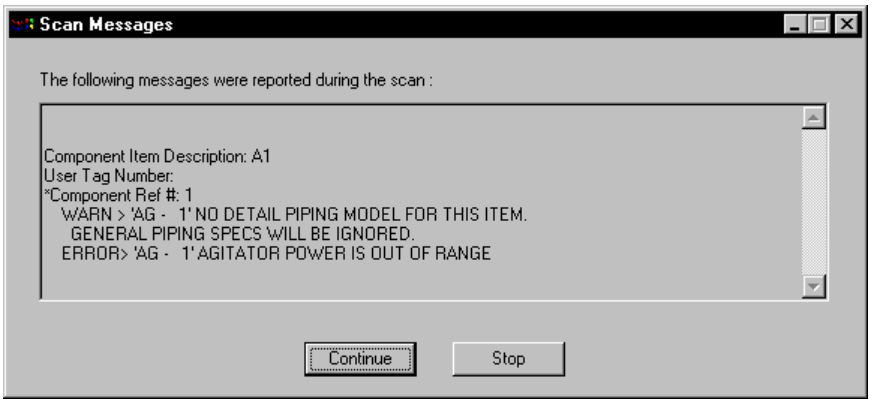
To run a project evaluation:

- Click on the toolbar.

  – or –

  On the **Run** menu, click **Evaluate Project**.

If you are using the default Preferences, Aspen In-Plant Cost Estimator scans the project specifications for errors and/or inconsistencies and any found are listed in the Scan Messages window.


Scan Messages
The following messages were reported during the scan :
Component Item Description: A1
User Tag Number:
*Component Ref #: 1
WARN > 'AG - 1' NO DETAIL PIPING MODEL FOR THIS ITEM.
GENERAL PIPING SPECS WILL BE IGNORED.
ERROR> 'AG - 1' AGITATOR POWER IS OUT OF RANGE
Continue
Stop

Note: You can select in Preferences to skip the scan for errors (see page 47).

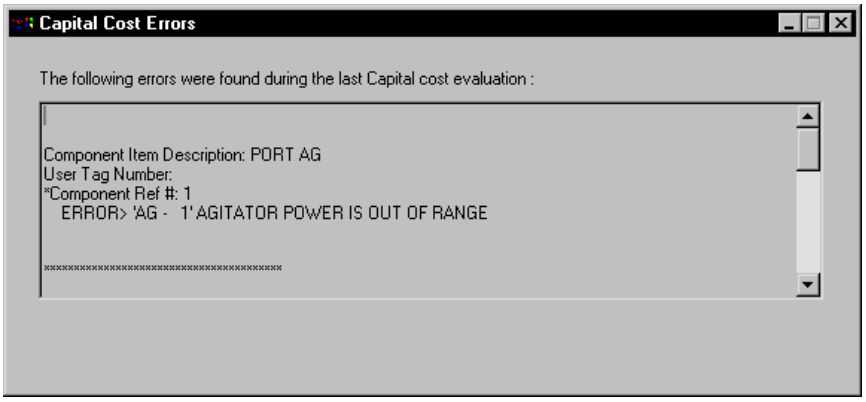
There are four types of messages:

Scan Message	Description/Importance Level

INFOrmational	For your information
WARNing	Design can be produced, but you are alerted to problems
ERROR	A design or cost cannot be produced for an item
FATAL	Rare instance for extreme problems

You have the option to continue or stop the evaluation process (except in the case of FATAL errors, which stop the evaluation process). You should carefully review these and fix any problems before proceeding.

When the project evaluation is done, Aspen In-Plant Cost Estimator lists all errors found in the capital cost evaluation for your reference.


Capital Cost Errors
The following errors were found during the last Capital cost evaluation :
Component Item Description: PORT AG
User Tag Number:
*Component Ref #: 1
ERROR> 'AG - 1' AGITATOR POWER IS OUT OF RANGE
****

If you are using the default Preferences, Aspen In-Plant Cost Estimator automatically launches Aspen Icarus Reporter.

Note: You can select in **Preferences** not to have Aspen In-Plant Cost Estimator automatically launch Reporter and load reports after project evaluation (see page 47).

Reviewing Results in Aspen Icarus Reporter

Accessing Reporter

If you are using the default preferences, Aspen In-Plant Cost Estimator automatically displays results in Reporter immediately after you run a project evaluation. If you have selected not to automatically display results, you will need to complete the steps below after running a project evaluation in order to display results in Reporter. Even if you are using the default preferences, you may want to use the following procedure if the project was evaluated previously and has not changed since.

To access Reporter:

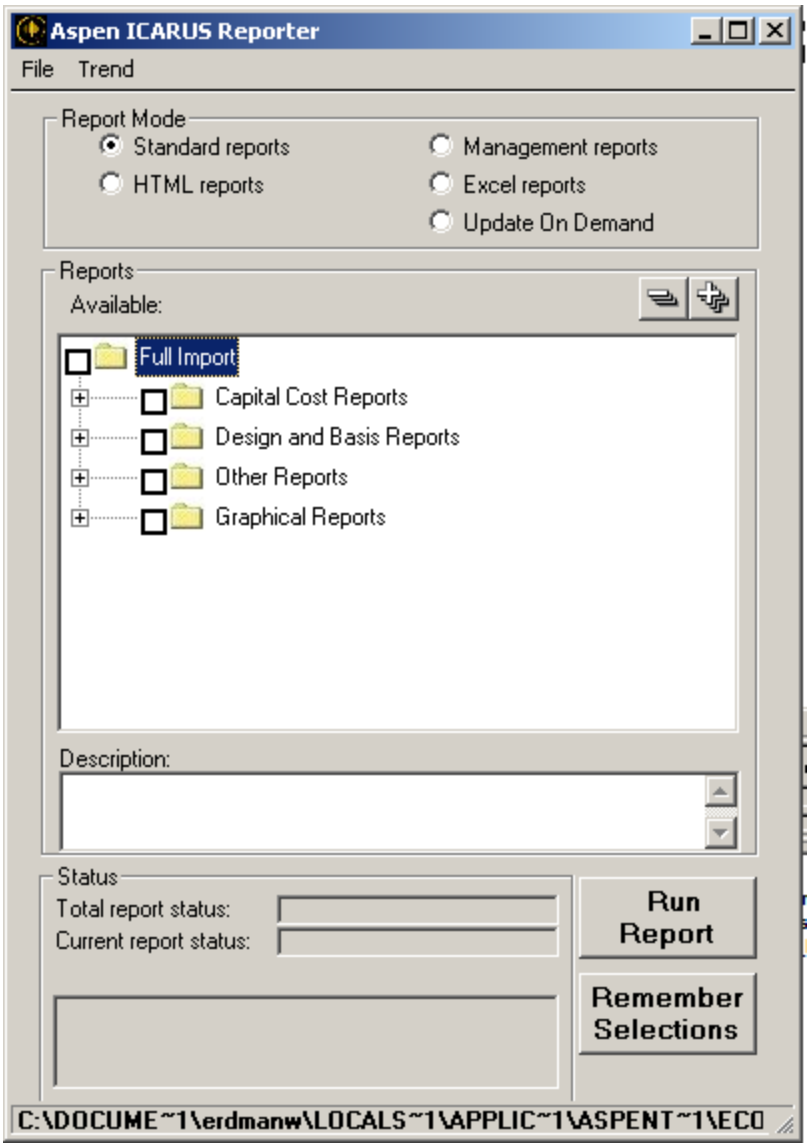
- Click on the toolbar.

  -or-

  Click **Capital Costs View** on the **View** menu

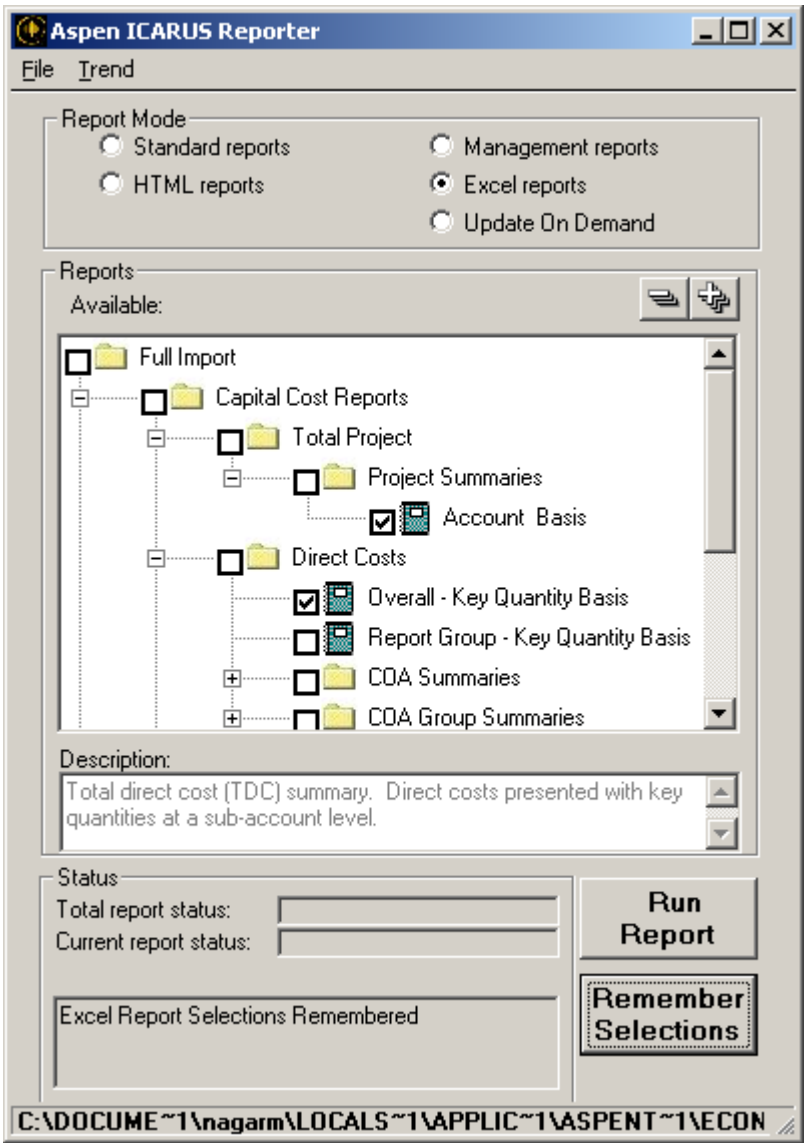
The Reporter imports and loads the reports from Aspen In-Plant Cost Estimator.

When the reports are done loading, the Aspen Icarus Reporter window appears.



Reporter allows you to select and run multiple *Standard reports* or *Excel reports* or *Update On Demand reports*. These selections can be remembered by clicking the ***Remember Selections*** button shown in the figure below. These selections are retained and shown the next time the Reporter application is run. In V7.3, reporter remembers these selections product as well as project wise.

In V7.2 and prior versions the selections are cleared once the reports are displayed. In V7.3 these selections are retained until you choose to do otherwise.



Remembering selections product wise

In V7.2 and prior versions, reporter does not remember these selections product wise separately and only remembers the last selections made among all the three Economic Evaluation Products (Aspen Capital Cost Estimator, Aspen In-Plant Cost Estimator and Aspen Economic Analyzer). In V7.3, this limitation has been removed and reporter can remember the selections for all the three types of products separately.

When a reporter application is run on a newly created project, last remembered selections (if any) for that product type are shown by default. Similarly, for an existing unsaved project last remembered selections (if any) for that product type are shown by default.

Remembering selections project wise

In V7.3, you can save selections product wise as well. These selections remembered by clicking ***Remember Selections*** can be saved permanently with the project by selecting the **File | Save** menu item or clicking the **Save Project** toolbar button on the main Economic Evaluation frame window. When the reporter is invoked on such a saved project, it retains the selections saved with the project.

Note: Clicking ***Remember Selections*** saves or updates the selections for the current report mode (***Standard Reports*** or ***Excel Reports*** or ***Update On Demand***) only. If you want to save or update the selections for other type of reports then you need to select that report type and then click ***Remember Selections*** after selecting the reports.

Clear these selections before adding or removing any new custom reports.

Aspen Icarus Reporter Menu Bar

File Menu

Click this	to
Import Data	Import project reports. See page 268 for instructions.
Run Report	Run Report – Run selected report. See pages 247 (Standard reports), 260 (Excel reports), and 255 (HTML reports) for instructions.
Open Workbook	Open the last Excel workbook created. See page 265 for instructions.
Create User Database	Export SQL Database. See page 269 for instructions.
Exit	Close Aspen Icarus Reporter.

Trend Menu

Click this	to
Add Trend Data to Database	Add the trend data from the project reports currently loaded in Aspen Icarus Reporter to the trending database. See page 266 for instructions.
Create New Trend in Excel	Create a new trend in Excel. See page 265 for instructions.
View Existing Trend Data	Open the trending data workbook in Excel. See "Data Trending," page 265 and following for instructions.
Clear All Saved Trends	Clear the trending database. See page 265 for instructions.

Which Report Mode?

There are five report modes:

- Standard reports
- HTML reports
- Management reports
- Excel reports
- Update on Demand reports

All but *Management reports* present Capital Costs and Design and Basis reports. *Management reports* contain snapshots of project data frequently requested by management.

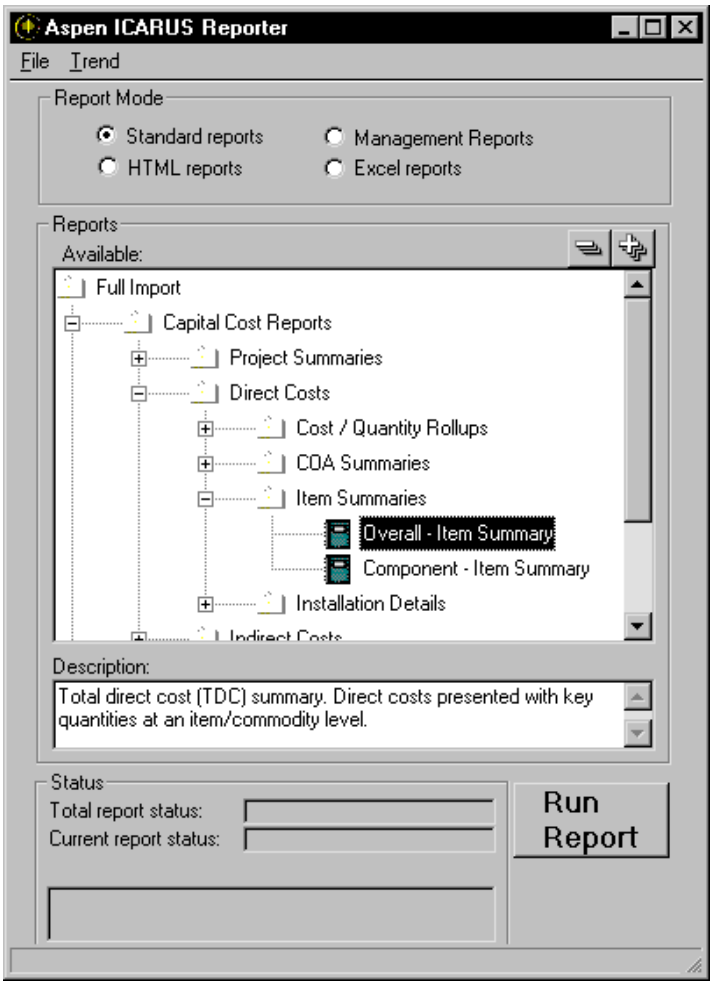
Standard, HTML, and Excel reports do not just present the same data in different applications. Because of the differing capabilities of the applications, data is presented differently in each. The choice of mode may depend upon what you wish to do with the data at a particular time.

Standard Reports

With *Standard reports* selected in the Report Mode section, the Reports section displays a tree-structure grouping of standard reports.

Report Descriptions

Open the necessary category and sub-category folders and click on a report to display a brief description of that report in the Description section.



Aspen Reporter displays a description of the selected report.

See page 247 for descriptions of all Standard reports.

Opening a Report

Not all of the reports contain each of the features described in this guide. For example, the Contents view only appears on reports with multiple sections. In order to see all the features described, select the *Overall – Item Summary* report located in the following folder:

Capital Cost Reports\Direct Costs\Item Summaries

To open the selected report:

- Click the **Run Report** button.

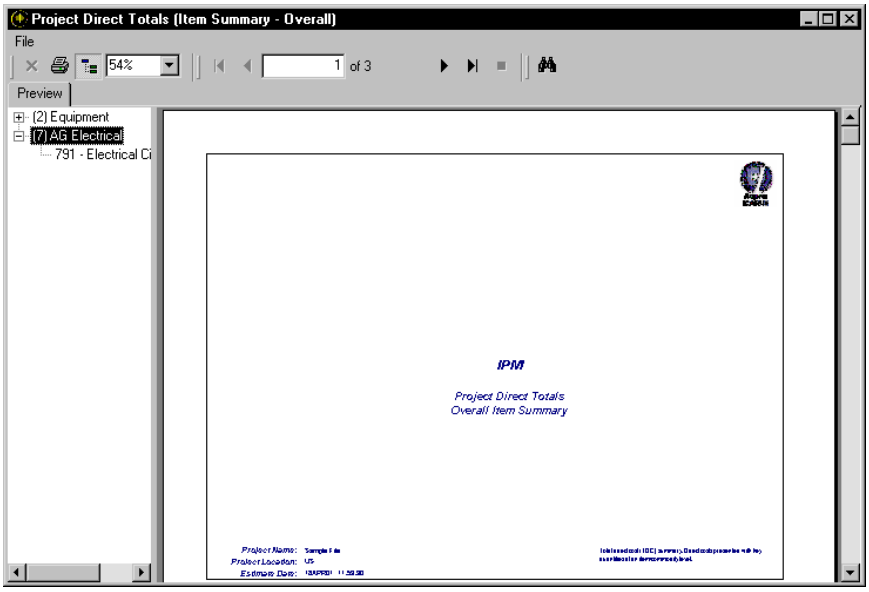
  - or -

  On the **File** menu, click **Run Report**.

  - or -

  Double-click on the report.

The report window appears.



Navigating

If there are multiple sections, a tree-structure Contents view appears on the left side of the window, allowing you to jump to a section simply by clicking the section in the Contents.

The arrow buttons on the toolbar let you page through the report:

Next Page

Previous Page

Last Page

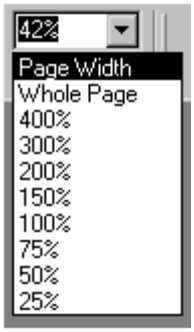
First Page

Because the last page of a report usually contains the totals, clicking the **Last Page** button is a convenient way to access them.

Magnification

To change the magnification level:

1 In the **Magnification** box, click , then click the desired level from the menu.



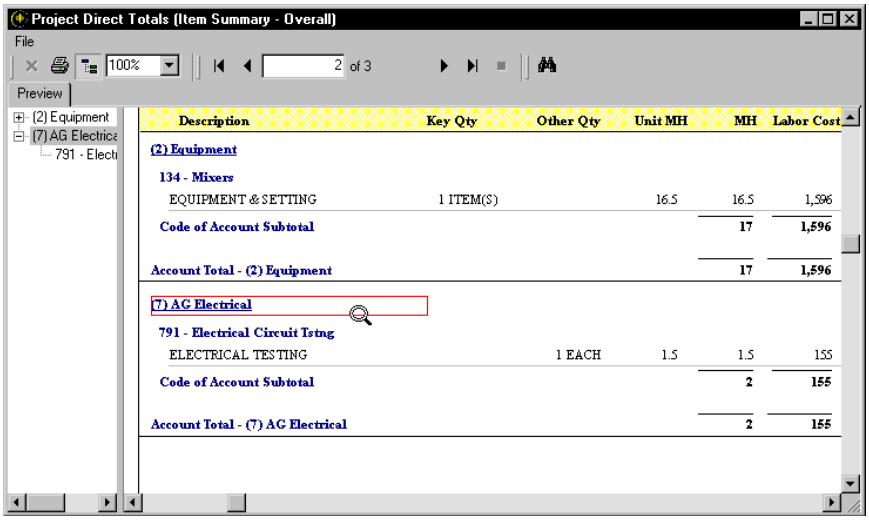
Note: You can also click directly in the **Magnification** box (without clicking) and then zoom in and out using the up and down arrow keys on your keyboard.

2 When viewing the report at large magnification, you may wish to hide the **Contents** view by clicking the Toggle Group Tree button . This makes more room for the report.

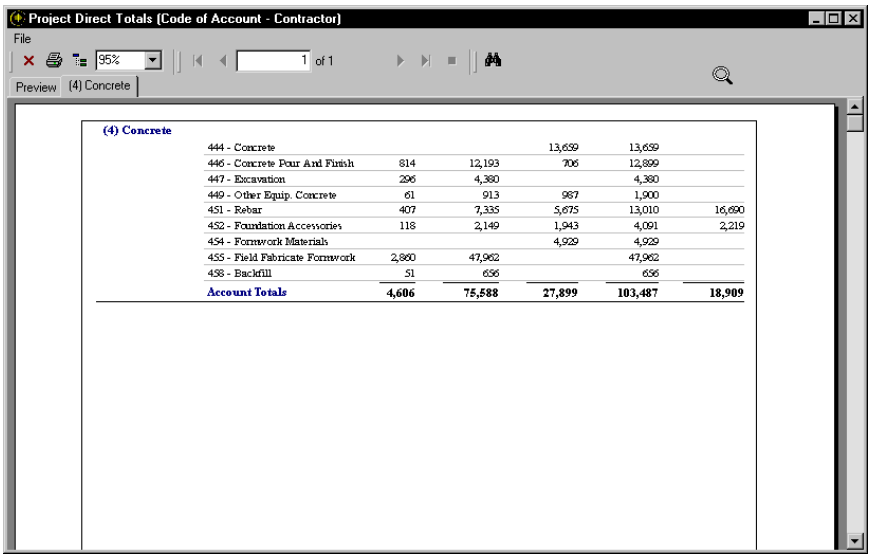
Segregating a Cost Section

If the cursor changes into a magnifying glass icon when placed over a cost section's title or totals, you can double-click to open a separate tab window containing only that cost section.

For example, in the ***Overall – Item Summary*** report, the cursor changes into a magnifying glass when placed over the AG Electrical cost section's title or totals.



Double-clicking on this cost section's titles or totals opens a separate tab window.


Project Direct Totals (Code of Account - Contractor)
File
95%
1 of 1
Preview
(4) Concrete
(4) Concrete
444 - Concrete 13,659 13,659
446 - Concrete Pour And Finish 814 12,193 706 12,899
447 - Excavation 296 4,380 4,380
449 - Other Equip. Concrete 61 913 987 1,900
451 - Rebar 407 7,335 5,675 13,010 16,690
452 - Foundation Accessories 118 2,149 1,943 4,091 2,219
454 - Formwork Materials 4,929 4,929
455 - Field Fabricate Formwork 2,860 47,962 47,962
458 - Backfill 51 656 656
Account Totals 4,606 75,588 27,899 103,487 18,909

Here, the Concrete cost section is displayed in a separate tab window, where it can be viewed and printed apart from the rest of the report.

Searching

To search the report:

1 Click .

2 Enter the text string for which you want to search and click Find Next.

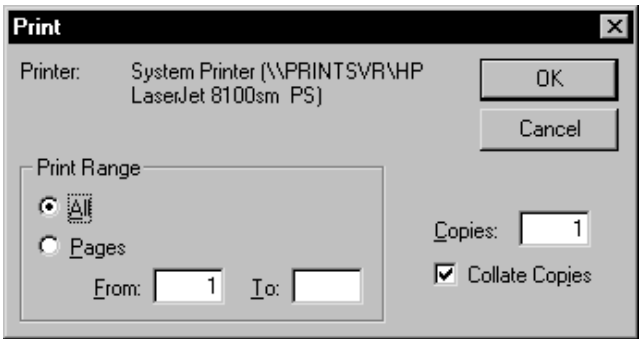
The next instance of the text string is framed in red.

Printing

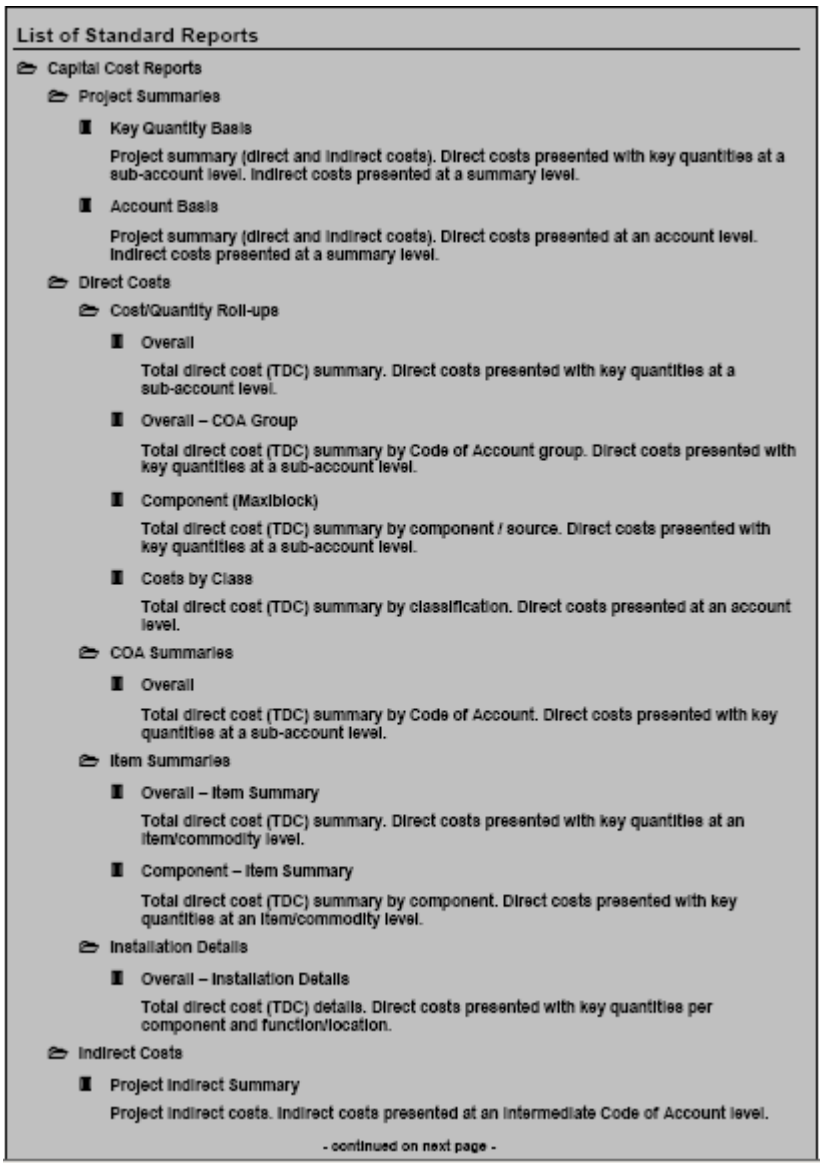
To print the report:

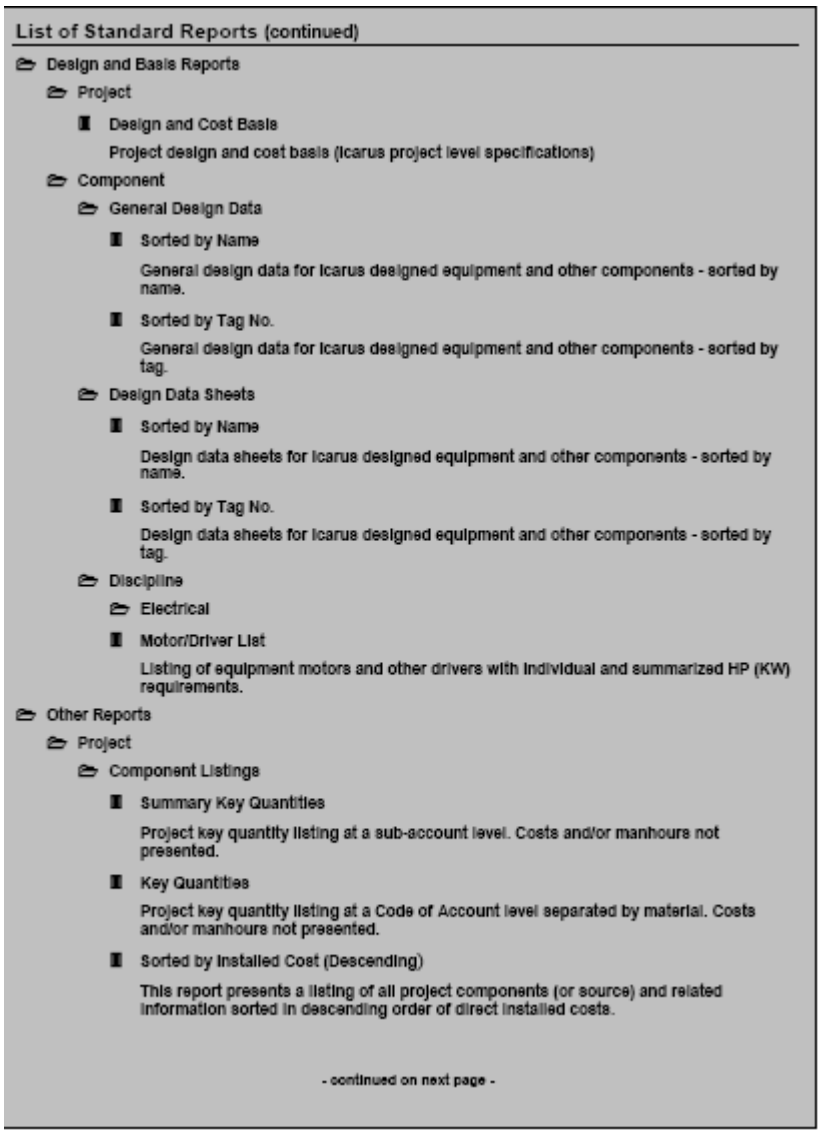
1 Click .

The **Print** dialog box appears.



2 Make any desired changes to the default settings and click **OK**.


List of Standard Reports
Capital Cost Reports
Project Summaries
Key Quantity Basis
Project summary (direct and indirect costs). Direct costs presented with key quantities at a sub-account level. Indirect costs presented at a summary level.
Account Basis
Project summary (direct and indirect costs). Direct costs presented at an account level. Indirect costs presented at a summary level.
Direct Costs
Cost/Quantity Roll-ups
Overall
Total direct cost (TDC) summary. Direct costs presented with key quantities at a sub-account level.
Overall – COA Group
Total direct cost (TDC) summary by Code of Account group. Direct costs presented with key quantities at a sub-account level.
Component (MaxIblock)
Total direct cost (TDC) summary by component / source. Direct costs presented with key quantities at a sub-account level.
Costs by Class
Total direct cost (TDC) summary by classification. Direct costs presented at an account level.
COA Summaries
Overall
Total direct cost (TDC) summary by Code of Account. Direct costs presented with key quantities at a sub-account level.
Item Summaries
Overall – Item Summary
Total direct cost (TDC) summary. Direct costs presented with key quantities at an item/commodity level.
Component – Item Summary
Total direct cost (TDC) summary by component. Direct costs presented with key quantities at an item/commodity level.
Installation Details
Overall – Installation Details
Total direct cost (TDC) details. Direct costs presented with key quantities per component and function/location.
Indirect Costs
Project Indirect Summary
Project indirect costs. Indirect costs presented at an intermediate Code of Account level.
- continued on next page -


List of Standard Reports (continued)
Design and Basis Reports
Project
Design and Cost Basis
Project design and cost basis (Icarus project level specifications)
Component
General Design Data
Sorted by Name
General design data for Icarus designed equipment and other components - sorted by name.
Sorted by Tag No.
General design data for Icarus designed equipment and other components - sorted by tag.
Design Data Sheets
Sorted by Name
Design data sheets for Icarus designed equipment and other components - sorted by name.
Sorted by Tag No.
Design data sheets for Icarus designed equipment and other components - sorted by tag.
Discipline
Electrical
Motor/Driver List
Listing of equipment motors and other drivers with individual and summarized HP (KW) requirements.
Other Reports
Project
Component Listings
Summary Key Quantities
Project key quantity listing at a sub-account level. Costs and/or manhours not presented.
Key Quantities
Project key quantity listing at a Code of Account level separated by material. Costs and/or manhours not presented.
Sorted by Installed Cost (Descending)
This report presents a listing of all project components (or source) and related information sorted in descending order of direct installed costs.
- continued on next page -

List of Standard Reports (continued)

- Other Reports (continued)
  - Project (continued)
    - Equipment Listings
      - Sorted by Installed Cost (Descending)

        This report presents a listing of all project equipment and related information sorted in descending order of direct installed costs.
      - Sorted by Name

        This report presents a listing of all project equipment and related information sorted by name.
      - Sorted by Classification

        This report presents a listing of all project equipment and related information sorted by equipment classification.
      - Sorted by Tag No.

        This report presents a listing of all project equipment and related information sorted by tag number.
    - Component
      - Summary Key Quantities

        Component key quantity listing at a Code of Account level separated by material. Costs and/or manhours not presented.
      - Key Quantities

        Component key quantity listing at a Code of Account level separated by material. Details are further separated by location/function. Costs and/or manhours not presented.
    - Discipline
      - Piping
        - Line List

          A line list report that provides quantity and design information by piping line.
      - Equipment
        - Material of Construction Unit Cost

          This report presents a listing of all project equipment unit costs per weight unit sorted in descending order.
- Graphical Reports
  - Project Direct Costs

    Graphical presentation of project direct cost totals.
  - Equipment Account

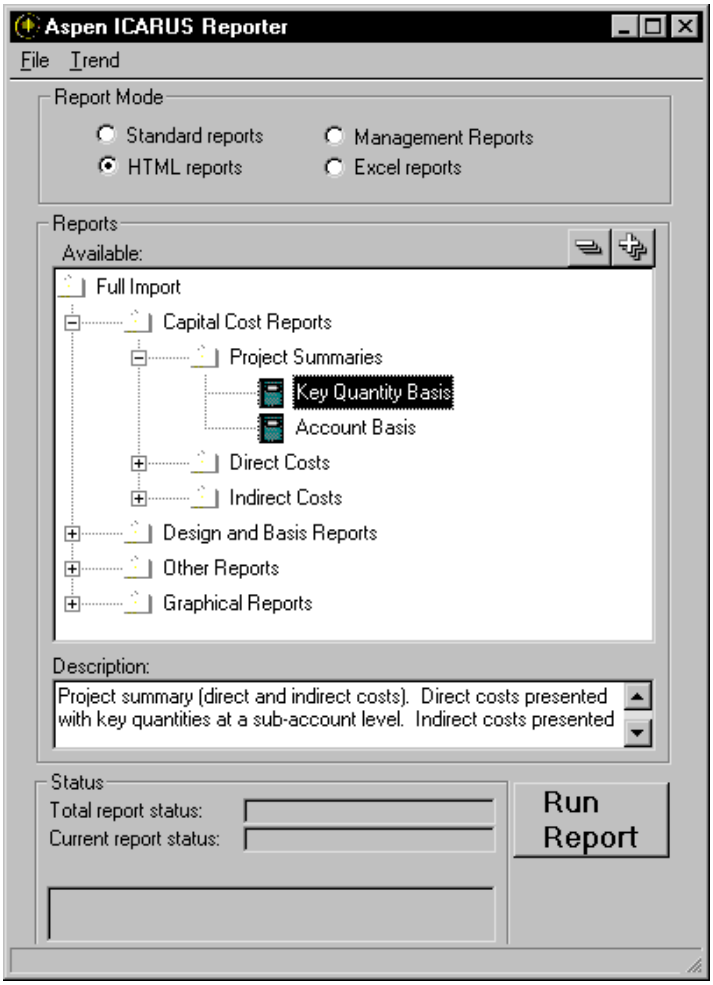
    Graphical presentation of relationships in the equipment account.

HTML Reports

With *HTML reports* selected in the Report Mode section, the Reports section displays a tree-structure grouping of HTML reports.

Report Descriptions

Open the necessary category and sub-category folders and click on a report to display a brief description of that report in the Description section.



Opening an HTML Report

To open the selected report:

Do one of the following:

1 Click the **Run Report** button.

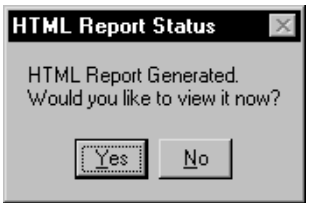
- or -

On the **File** menu, click **Run Report**.

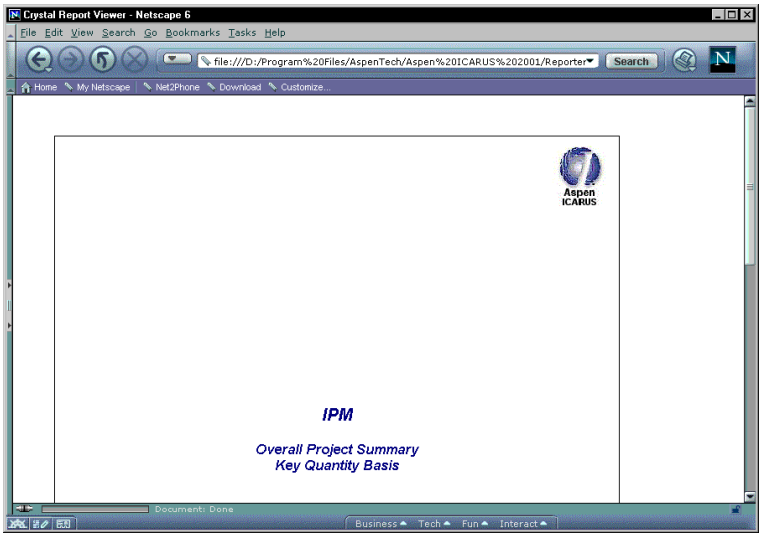
- or -

Double-click on the report.

A status window tells you when the export is complete and asks if you would like to view the report now.



2 Click **Yes** and the report is displayed in your browser.



Note: Generating the report as an .**htm** file allows the report to be sent in an e-mail.

Management Reports

With *Management Reports* selected in the Report Mode section, the Reports section displays a tree-structure grouping of Management reports. These reports are intended to serve as snapshots of the project scenario.

Opening a Management Report

To open a Management report:

1 Select the report.

2 Do one of the following:

- Click the **Run Report** button.

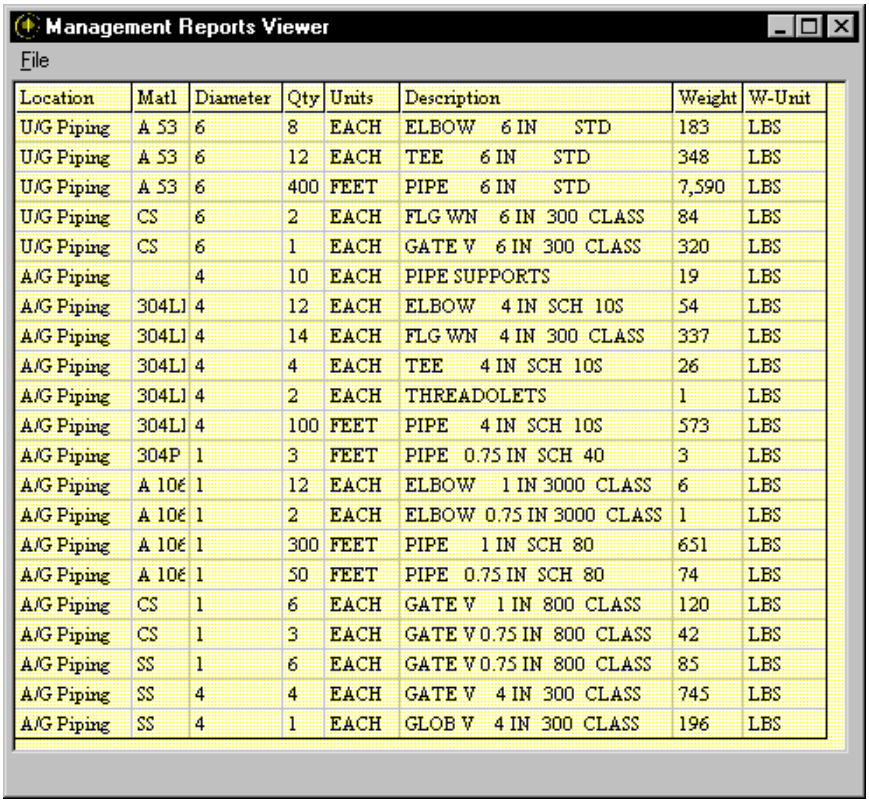
- or -

- On the **File** menu, click **Run Report**.

- or -

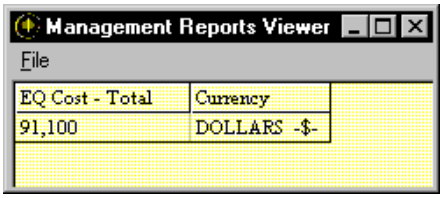
- Double-click on the report.

The **Management Reports Viewer** displays the report. Pictured below is the **Detailed Weight Information** report, one of the **Piping** reports in the **Discipline** folder.



Location	Matl	Diameter	Qty	Units	Description	Weight	W-Unit
U/G Piping	A 53	6	8	EACH	ELBOW 6 IN STD	183	LBS
U/G Piping	A 53	6	12	EACH	TEE 6 IN STD	348	LBS
U/G Piping	A 53	6	400	FEET	PIPE 6 IN STD	7,590	LBS
U/G Piping	CS	6	2	EACH	FLG WN 6 IN 300 CLASS	84	LBS
U/G Piping	CS	6	1	EACH	GATE V 6 IN 300 CLASS	320	LBS
A/G Piping		4	10	EACH	PIPE SUPPORTS	19	LBS
A/G Piping	304L]	4	12	EACH	ELBOW 4 IN SCH 10S	54	LBS
A/G Piping	304L]	4	14	EACH	FLG WN 4 IN 300 CLASS	337	LBS
A/G Piping	304L]	4	4	EACH	TEE 4 IN SCH 10S	26	LBS
A/G Piping	304L]	4	2	EACH	THREADOLETS	1	LBS
A/G Piping	304L]	4	100	FEET	PIPE 4 IN SCH 10S	573	LBS
A/G Piping	304P	1	3	FEET	PIPE 0.75 IN SCH 40	3	LBS
A/G Piping	A 10€	1	12	EACH	ELBOW 1 IN 3000 CLASS	6	LBS
A/G Piping	A 10€	1	2	EACH	ELBOW 0.75 IN 3000 CLASS	1	LBS
A/G Piping	A 10€	1	300	FEET	PIPE 1 IN SCH 80	651	LBS
A/G Piping	A 10€	1	50	FEET	PIPE 0.75 IN SCH 80	74	LBS
A/G Piping	CS	1	6	EACH	GATE V 1 IN 800 CLASS	120	LBS
A/G Piping	CS	1	3	EACH	GATE V 0.75 IN 800 CLASS	42	LBS
A/G Piping	SS	1	6	EACH	GATE V 0.75 IN 800 CLASS	85	LBS
A/G Piping	SS	4	4	EACH	GATE V 4 IN 300 CLASS	745	LBS
A/G Piping	SS	4	1	EACH	GLOB V 4 IN 300 CLASS	196	LBS

Other reports, like the Equipment Cost (Total Cost) report shown below, show simply a bottom-line total.



EQ Cost - Total	Currency
91,100	DOLLARS -$-

Exporting Management Reports to Excel

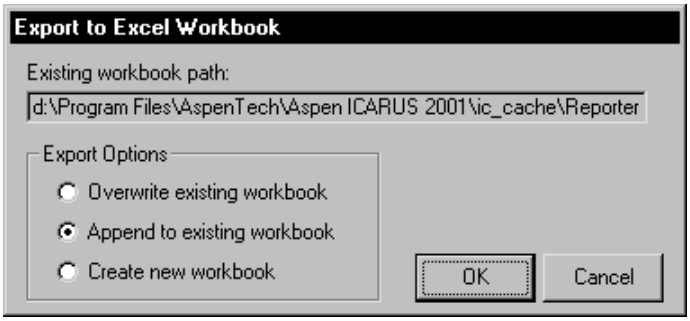
You can export Management reports to Excel. This is particularly useful for when you want to be able to e-mail the report.

To export a Management report to Excel:

1 Click **Export to Excel** on the Viewer's **File** menu.

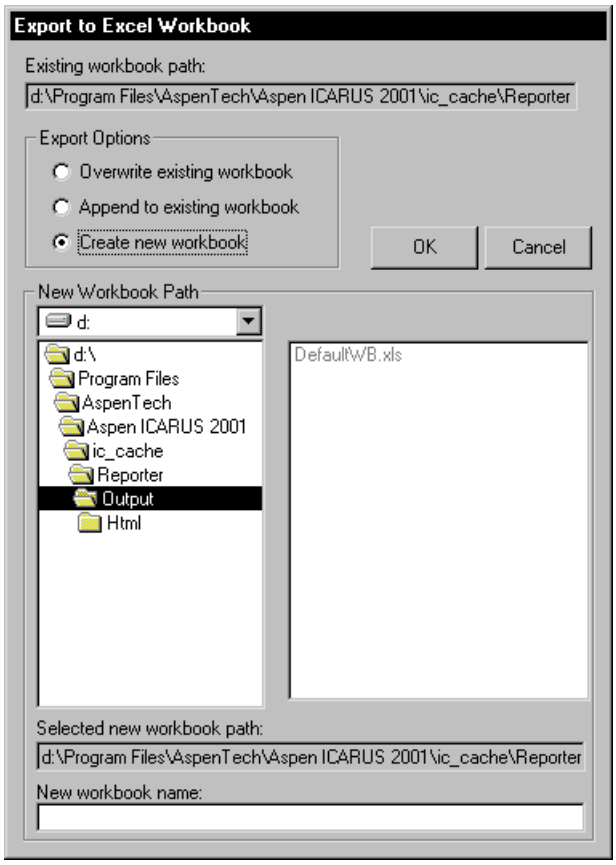
Reporter searches for the last Excel workbook to which you exported a report.

- If no existing workbook is found, Reporter asks you to specify a worksheet name (see step 3) and creates a workbook – either DefaultWB.xls in the Reporter output folder (if this is your first export to Excel since last re-booting) or a workbook with the file and path name of the last workbook to which you exported since starting your computer.
- If an existing workbook is found, the Export to Excel Workbook dialog box appears, asking if you want to overwrite the existing workbook, append the report to the existing workbook, or create a new workbook.



Select	To do this
Overwrite existing workbook	Reset the existing workbook with the selected report as the only worksheet; any previously created worksheets will be cleared.
Append to existing workbook	Add the report as another worksheet in the existing workbook; previously created worksheets will be retained.
Create new workbook	Specify a new workbook in which the selected report will appear as a worksheet.

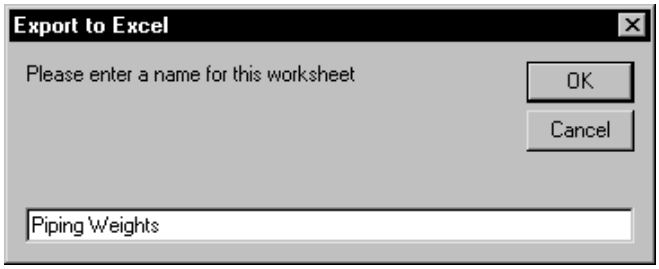
Clicking **Create new workbook** expands the dialog box to let you select a folder and enter a file name.



Note: Do not enter a file extension or period when entering a new workbook name.

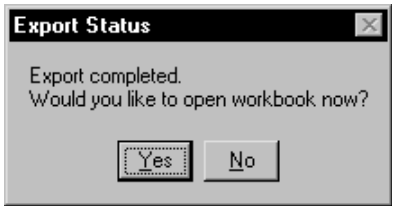
2 Make your selection; then click **OK**.

3 Enter a name for the worksheet.



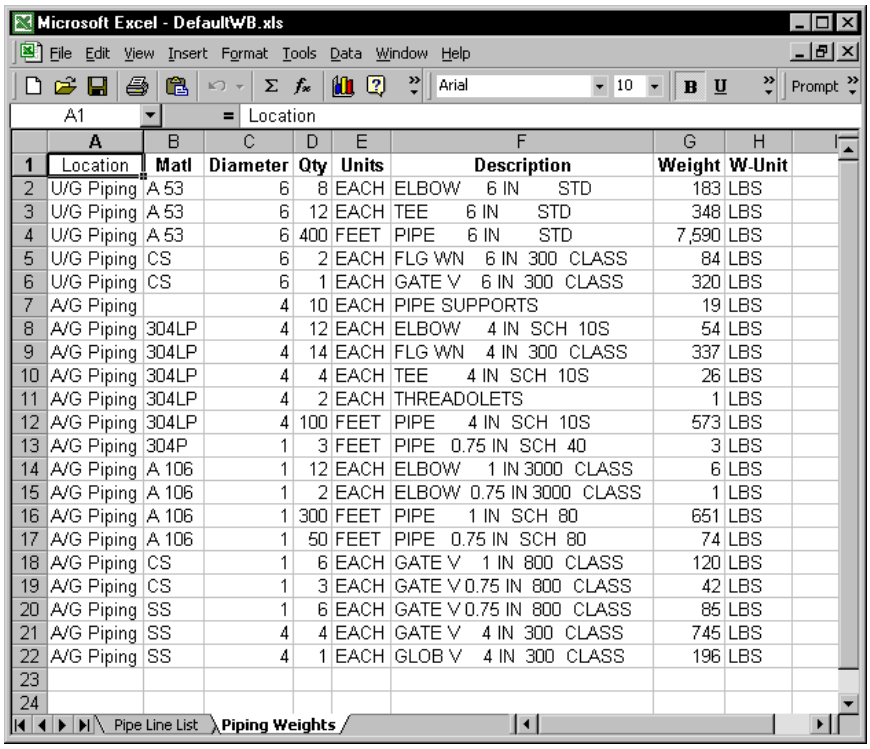
4 Click **OK**.

The **Export Status** dialog box informs you when the export is done and asks if you would like to open the workbook now.



5 Click **Yes** to open the workbook.

Excel displays the report.


Microsoft Excel - DefaultWB.xls
File Edit View Insert Format Tools Data Window Help
Arial 10 Prompt
A1 = Location
Pipe Line List
Piping Weights

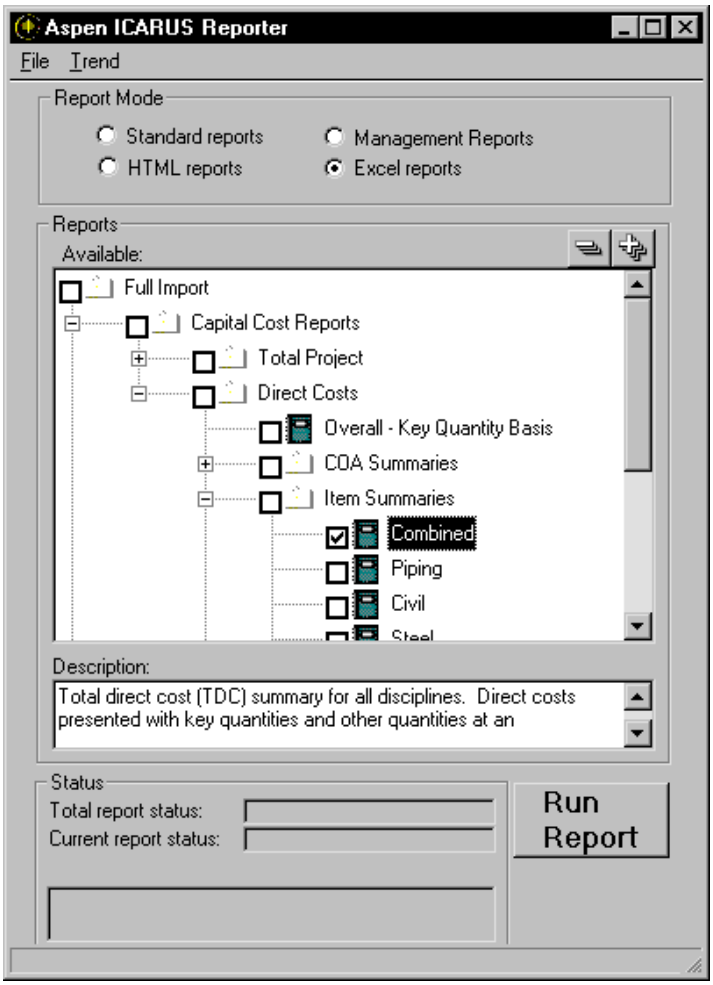
	A	B	C	D	E	F	G	H
1	Location	Matl	Diameter	Qty	Units	Description	Weight	W-Unit
2	U/G Piping	A 53	6	8	EACH	ELBOW 6 IN STD	183	LBS
3	U/G Piping	A 53	6	12	EACH	TEE 6 IN STD	348	LBS
4	U/G Piping	A 53	6	400	FEET	PIPE 6 IN STD	7,590	LBS
5	U/G Piping	CS	6	2	EACH	FLG WN 6 IN 300 CLASS	84	LBS
6	U/G Piping	CS	6	1	EACH	GATE V 6 IN 300 CLASS	320	LBS
7	A/G Piping		4	10	EACH	PIPE SUPPORTS	19	LBS
8	A/G Piping	304LP	4	12	EACH	ELBOW 4 IN SCH 10S	54	LBS
9	A/G Piping	304LP	4	14	EACH	FLG WN 4 IN 300 CLASS	337	LBS
10	A/G Piping	304LP	4	4	EACH	TEE 4 IN SCH 10S	26	LBS
11	A/G Piping	304LP	4	2	EACH	THREADOLETS	1	LBS
12	A/G Piping	304LP	4	100	FEET	PIPE 4 IN SCH 10S	573	LBS
13	A/G Piping	304P	1	3	FEET	PIPE 0.75 IN SCH 40	3	LBS
14	A/G Piping	A 106	1	12	EACH	ELBOW 1 IN 3000 CLASS	6	LBS
15	A/G Piping	A 106	1	2	EACH	ELBOW 0.75 IN 3000 CLASS	1	LBS
16	A/G Piping	A 106	1	300	FEET	PIPE 1 IN SCH 80	651	LBS
17	A/G Piping	A 106	1	50	FEET	PIPE 0.75 IN SCH 80	74	LBS
18	A/G Piping	CS	1	6	EACH	GATE V 1 IN 800 CLASS	120	LBS
19	A/G Piping	CS	1	3	EACH	GATE V 0.75 IN 800 CLASS	42	LBS
20	A/G Piping	SS	1	6	EACH	GATE V 0.75 IN 800 CLASS	85	LBS
21	A/G Piping	SS	4	4	EACH	GATE V 4 IN 300 CLASS	745	LBS
22	A/G Piping	SS	4	1	EACH	GLOB V 4 IN 300 CLASS	196	LBS
23								
24								

Excel Reports

With *Excel reports* selected in the Report Mode section, the Reports section displays a tree-structure grouping of Excel reports.

Report Descriptions

Open the necessary category and sub-category folders and click on a report to display a brief description of that report in the Description section.

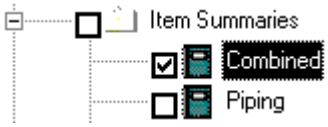


Aspen Reporter displays a description of the selected Excel report.

Opening an Excel Report

To open a report:

1 Select the check box next to the desired report.



You can mark multiple report checkboxes to open multiple reports.

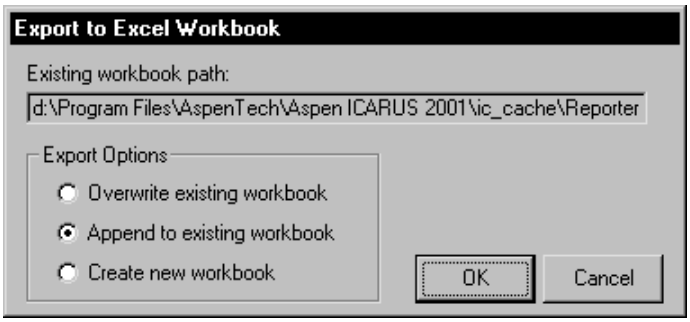
Marking a folder's checkbox will open all of the reports in the folder.

2 Click the Run Report button or click Run Report from the File menu.

Reporter searches for the last Excel workbook to which you exported a report.

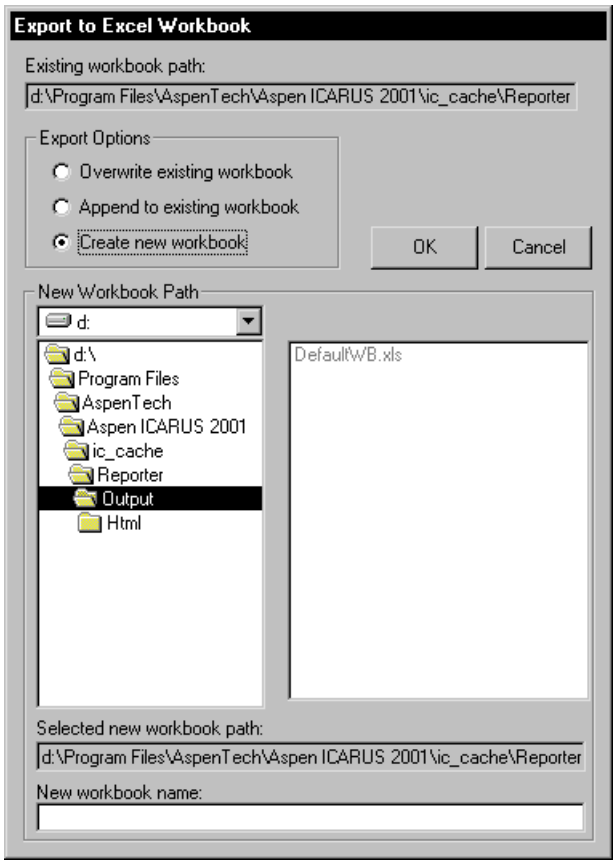
- If no existing workbook is found and this is your first export to Excel during this session, Reporter creates **DefaultWB.xls** in the Reporter output folder:

  ...Economic Evaluation V7.3\ic_cache\Reporter\Output
- If no existing workbook is found, but you have exported from Reporter to Excel since you last started you computer (to a file that's since been moved or deleted), Reporter creates a workbook with the file and path name of the last workbook to which you exported.
- If an existing workbook is found, the Export to Excel Workbook dialog box appears, asking if you want to overwrite the existing workbook, append the report to the existing DefaultWB.xls workbook, or create a new workbook.



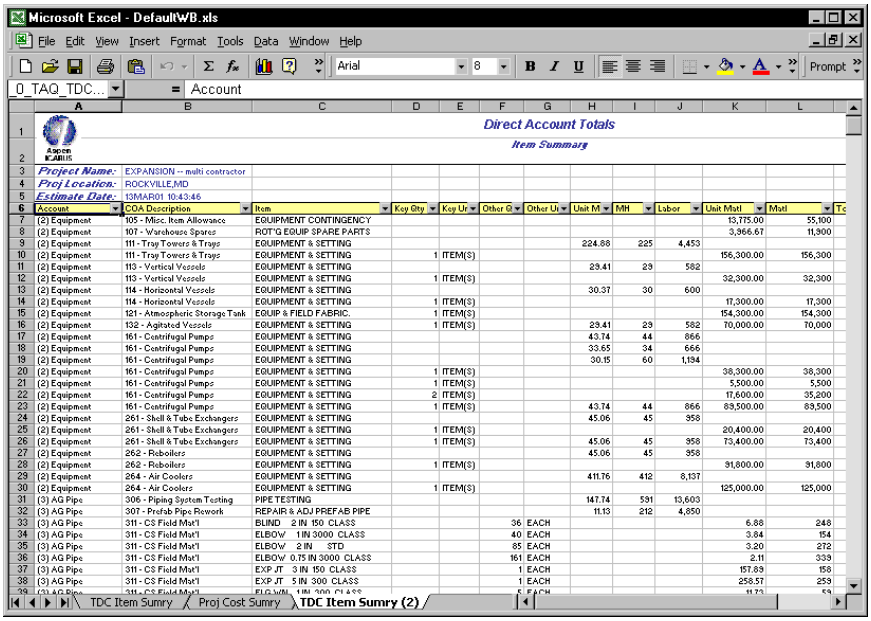
Select	To do this
Overwrite existing workbook	Reset the existing workbook with the selected report as the only worksheet; any previously created worksheets will be cleared.
Append to existing workbook	Add the report as another worksheet in the existing workbook; previously created worksheets will be retained.
Create new workbook	Specify a new workbook in which the selected report will appear as a worksheet.

Selecting **Create new workbook** expands the dialog box to let you enter a workbook path and name.



Note: Do not enter a file extension or period when entering a new workbook name.

After you make your selection and click **OK**, Excel opens a workbook displaying the report.


Microsoft Excel - DefaultWB.xls
File Edit View Insert Format Tools Data Window Help
Direct Account Totals
Item Summary
Project Name: EXPANSION -- multi contractor
Proj Location: ROCKVILLE,MD
Estimate Date: 13MAR01 10:43:46
TDC Item Sumry
Proj Cost Sumry
TDC Item Sumry (2)

Note: Exporting the report to an .xls file allows it to be sent in an e-mail.

AutoFilter

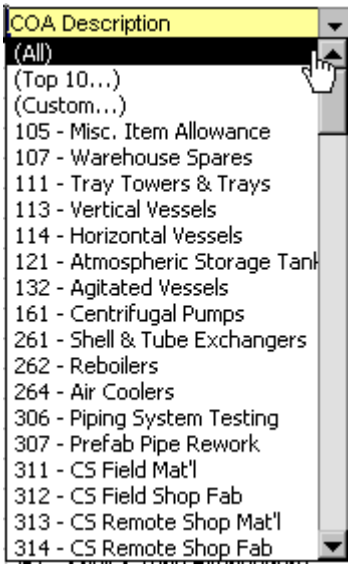
Several of the larger Excel reports generated by IPE take advantage of the **AutoFilter** feature in Excel.

To view a report that includes AutoFilter:

- Open the following report:

  Capital Cost Reports\Direct Costs\Item Summaries\Combined

When AutoFilter is available, clicking next to a column displays a list of all the different entries made in the column. Selecting an entry displays only rows that contain that entry in the column.


COA Description
(All)
(Top 10...)
(Custom...)
105 - Misc. Item Allowance
107 - Warehouse Spares
111 - Tray Towers & Trays
113 - Vertical Vessels
114 - Horizontal Vessels
121 - Atmospheric Storage Tank
132 - Agitated Vessels
161 - Centrifugal Pumps
261 - Shell & Tube Exchangers
262 - Reboilers
264 - Air Coolers
306 - Piping System Testing
307 - Prefab Pipe Rework
311 - CS Field Mat'l
312 - CS Field Shop Fab
313 - CS Remote Shop Mat'l
314 - CS Remote Shop Fab

For example, selecting **105 – Misc. Item Allowance** in the **COA Description** column of the **Item Summary Combined** report would display only accounts with Code of Account (COA) 105.

Selecting **Top Ten** displays only items that contain one of the top ten most frequent entries.

Selecting **Blanks** (from the bottom of the list) displays only rows that contain a blank cell in the column, while selecting **NonBlanks** displays only rows that contain a value in the column.

Opening Workbook Without Running Report

To view the last workbook created without running a new report:

- On the **File** menu, click **Open Workbook**.

Data Trending

Data Trending facilitates comparison of scenarios by allowing you to review capital cost summaries of different scenarios in a single Excel workbook. If, for example, you created three different scenarios for a project, you could use the Data Trending feature to display the direct costs of each on one spreadsheet, with a separate row for each scenario.

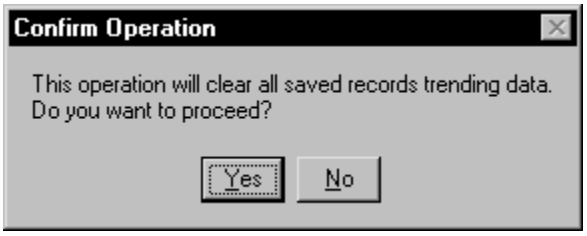
Clearing Trending Database

Because you only want to compare certain scenarios, the first step is usually to clear the database used to populate the Excel trending workbook.

To clear the trending database:

1 On the **Trend** menu, click **Clear All Saved Trends**.

A confirmation dialog box appears.



2 Click **Yes** to confirm clearing of the data.

The **Trending Data Update** dialog box tells when this is done.

3 Click **OK**.

Adding Trend Data to Database

The next step is to add trend data to the database.

To add the current project reports' trend data to the database:

1 On the **Trend** menu, click **Add Trend Data to Database**.

The **Trending Data Update** dialog box tells you when Reporter has finished adding the trend data.

2 Click **OK**.

You will need to add the trend data from the project reports of the other scenarios you are comparing. For each of the other scenarios, open the reports in Reporter and complete the *Adding Trend Data to Database* instructions above.

Using Reporter's **import** function, you can open the other scenarios' reports in Reporter without opening the scenarios in IPE. See page 268 for instructions.

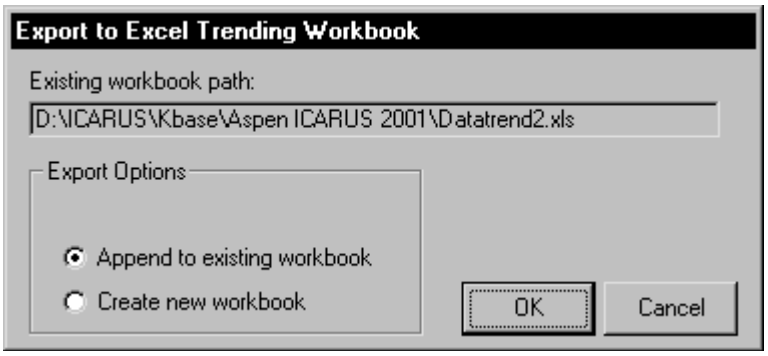
Creating a New Trend in Excel

After you have added the trend data from the **Capital Cost** reports of the scenarios you are comparing, you are ready to create a new trend in Excel.

To create a new trend in Excel:

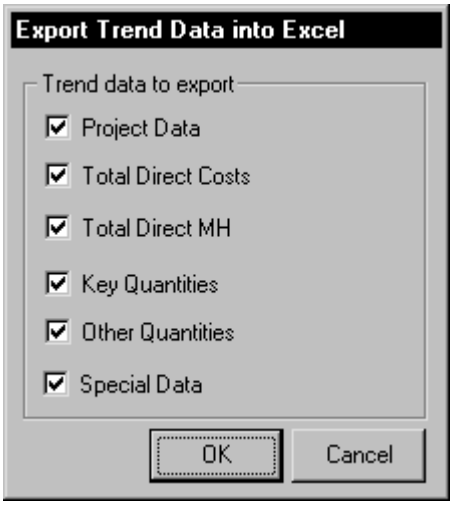
1 On the **Trend** menu, click **Create New Trend in Excel**.

The **Export to Excel Trending Workbook** dialog box gives you the choice of either appending the trend data to the existing file or creating a new file.



2 Make you selection; then click **OK**.

The **Export Trend Data into Excel** dialog box appears. By default, all six capital cost categories are marked.

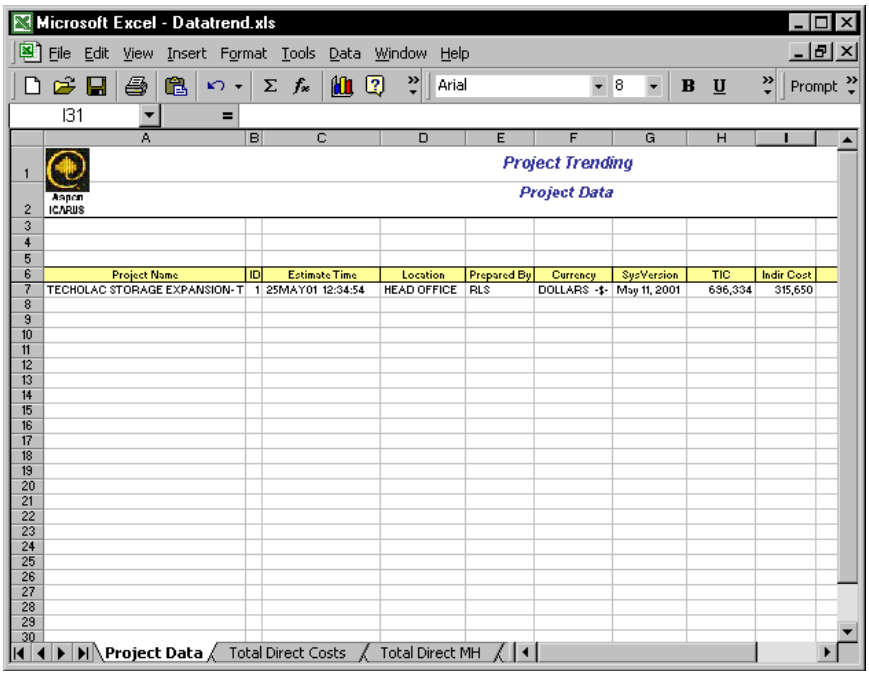


3 Clear any categories you want to exclude from the workbook; then click **OK**.

The **Export Status** window tells you when the export is complete and asks if you would like to open the trending workbook now.

4 Click **Yes**.

Excel displays the trending workbook containing a spreadsheet for each of the capital cost categories. Each set of trend data entered into the trending database is displayed on a separate row. (The workbooks for any categories excluded at the Export Trend Data into Excel dialog box are blank).



5 After having created the trending workbook, you can access it from Reporter by clicking **View Existing Trend Data** on the **View** menu.

Importing Data into Aspen Icarus Reporter

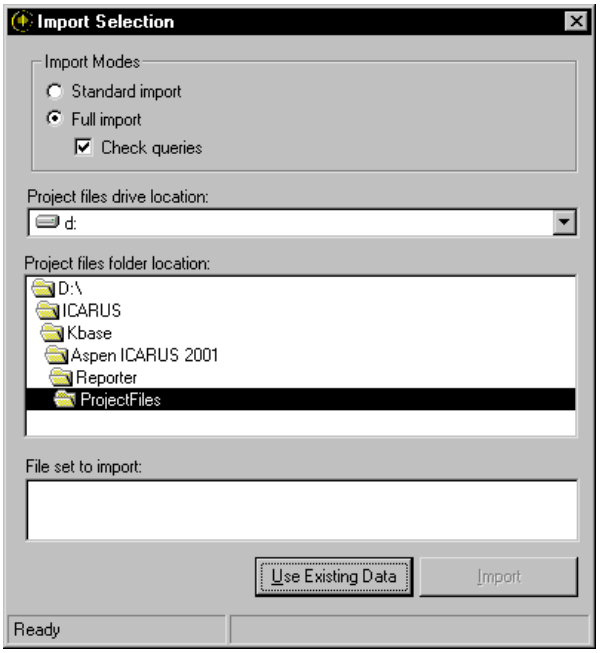
When you have a project scenario open in IPE and select **Capital Costs** (Interactive) from IPE, Reporter automatically imports that project scenario's **Capital Cost** reports as it opens.

However, once you're at the **Aspen Icarus Reporter** window, you can import a project scenario's **Capital Cost** reports without having the project scenario open in Aspen Process Economic Analyzer.

To import a Capital Cost report:

1 Click I**mport Data** from the **File** menu.

The **Import Selection** dialog box appears.



2 Use the browse tree to locate the project scenario folder, which should be at:

…Archives_IPE\[Project]\[Project Scenario]

After clicking the project scenario folder, **PROJID** should appear in the **File set to import** section.

3 Click **PROJID**; then click **Import**.

Reporter imports the data. When complete, the selected scenario's reports can be run from Reporter.

Creating a User Database

You can export the Icarus SQL Database, listing the Relation attributes used by the Icarus Evaluation Engine (IEE), to a Microsoft Access Database (.mdb) file.

ICARUS Reference, Chapter 35, "Database Relations", defines the ICARUS Database Relations and the different attributes under each.

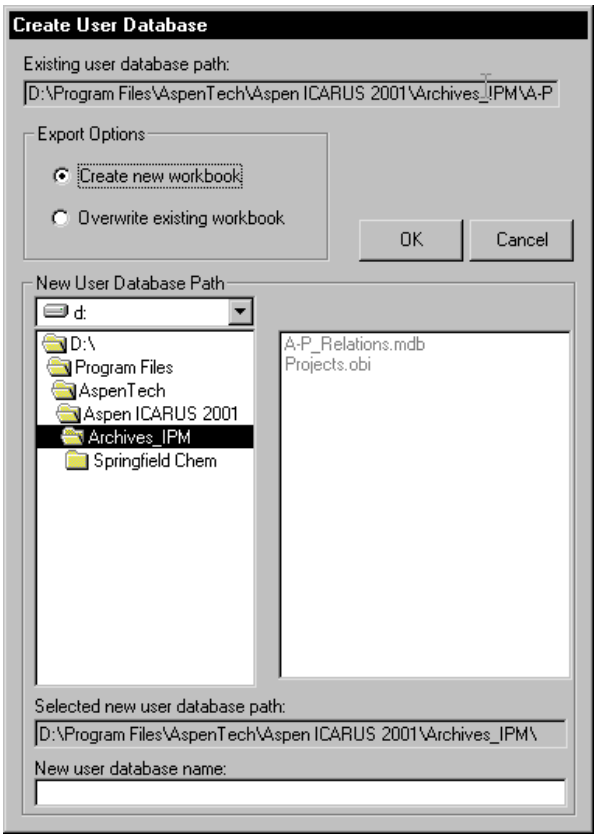
To create a user database:

1 Click **Create User Database** on the **File** menu.

Reporter searches for the last **.mdb** file it created.

- If the file is not found or if this is your first database creation, the Create User Database dialog box appears with only one Export Option: Create New Workbook. The lower part of the dialog box provides fields for selecting a path and filename.

- However, if the last created file is found, the Export Options also include **Overwrite Existing Workbook**. This option is marked by default, so the lower part of the dialog box is not visible until you select the **Create New Workbook** check box.



2 Select a folder, enter a database name, and then click **OK**.

Reporter creates the **.mdb** file.

3 To review and work with the database, start Microsoft Access and open the **.mdb** file.

Item Evaluation

Aspen In-Plant Cost Estimator lets you run an evaluation on a single component and view an Item Report. For heat exchangers, the Item Report summarizes sizing data. For other equipment, the Item Report summarizes material costs, manpower costs, and man-hours.

To run an item evaluation and view an Item Report:

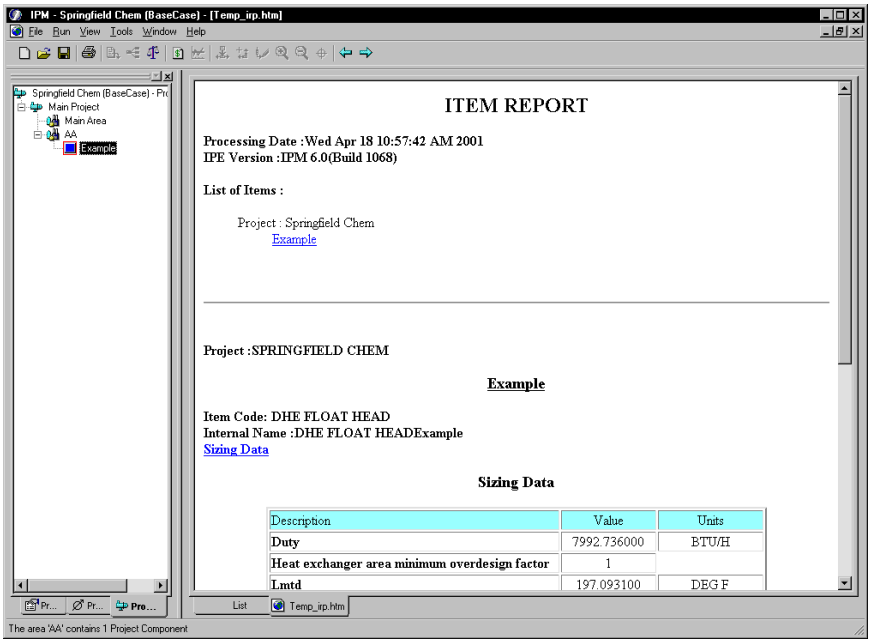
1 Right-click on the component in either Project Explorer or the List view, and then click Evaluate Item on the pop-up menu.

Aspen In-Plant Cost Estimator runs the item evaluation.

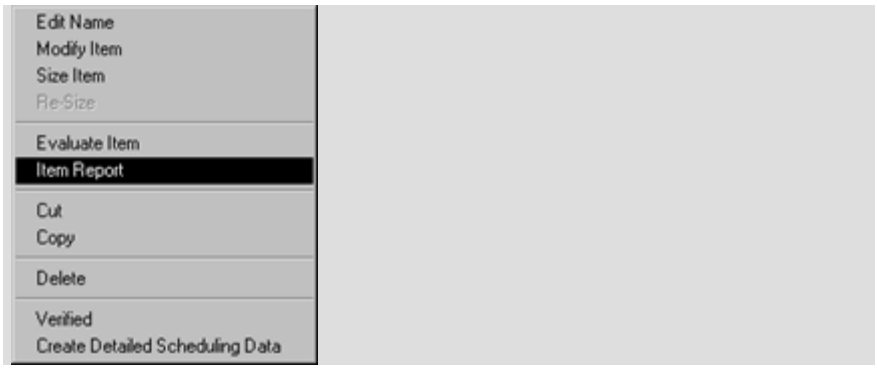
Right-click on the component and click Item Report on the pop-up menu.

You can also click the **Evaluate** button on the **Component Specifications** form to run the item evaluation and display the Item Report:

Aspen In-Plant Cost Estimator displays the Item Report in the Main Window.



Note: If the evaluation has already been run, you only have to select Item Report.



2 You can include multiple components in the Item Report: on the List view (area level), select the desired components, right-click on one of the components, and click Item Report on the pop-up window. The resulting Item Report lists individually the summary data (cost or sizing) for each selected component.

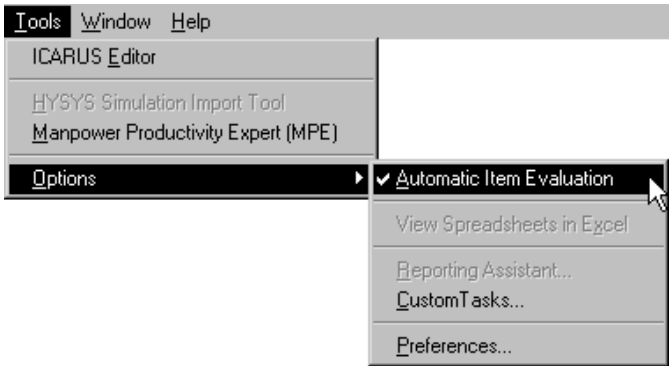
Automatic Item Evaluation

You can have Aspen In-Plant Cost Estimator automatically run an item evaluation whenever you click **OK** or **Apply** on a **Component Specifications** form.

To turn automatic item evaluation on and off:

1 On the **Tools** menu, point to **Options**.

2 On the **Options** sub-menu, a check mark appears next to **Automatic Item Evaluation** when the feature is turned on. Clicking **Automatic Item Evaluation** turns the feature on and off.



Sample Item Report

The following Item Report is for a floating head shell and tube heat exchanger with "Example" as its item description.

ITEM REPORT

Processing Date :Wed Apr 18 10:57:42 AM 2001
Version :Aspen In-Plant Cost Estimator 6.0

List of Items :

Project : Springfield Chem
Example

Project :SPRINGFIELD CHEM

Example

Item Code: DHE FLOAT HEAD
Internal Name :DHE FLOAT HEADExample
Sizing Data

Sizing Data

Description	Value	Units
Duty	7992736	BTU/H
Heat exchanger area minimum overdesign factor	1.15	
Lmtd	197.0931	DEG F
Overall u	356.3942	BTU/H/SF/DEG F
Raw surface area	113.8684	SF
Required surface area (with overdesign)	130.9487	SF
Shell side fouling resistance	0.001	H SF DEG F/BTU
Shell side heat transfer coefficient	1052.632000	BTU/H/SF/DEG F
Side for hot stream	Tube	
Temperature correction factor	0.9992875	
Tube side fouling resistance	0.0003	H SF DEG F/BTU
Tube side heat transfer coefficient	5131.682	BTU/H/SF/DEG F
Utility	Steam @100PSI	

- continued on next page –

Sample Item Report (continued)

Summary Costs

Item	Material(-$-)	Manpower(-$-)	Manhours
Equipment&Setting	12100.	1846.	40
Piping	0.	0.	0
Civil	0.	0.	0
Structural Steel	0.	0.	0
Instrumentation	0.	0.	0
Electrical	0.	0.	0
Insulation	0.	0.	0
Paint	0.	0.	0
Subtotal	**12100**	**1846**	**40**

Total material and manpower cost=-$- 13900.

8 Developing a Schedule

From the detailed design and cost data generated during an estimate, Aspen In-Plant Cost Estimator generates a preliminary schedule and cost report that you can develop further in your scheduling program.

Installing Icarus Project Scheduler (IPS)

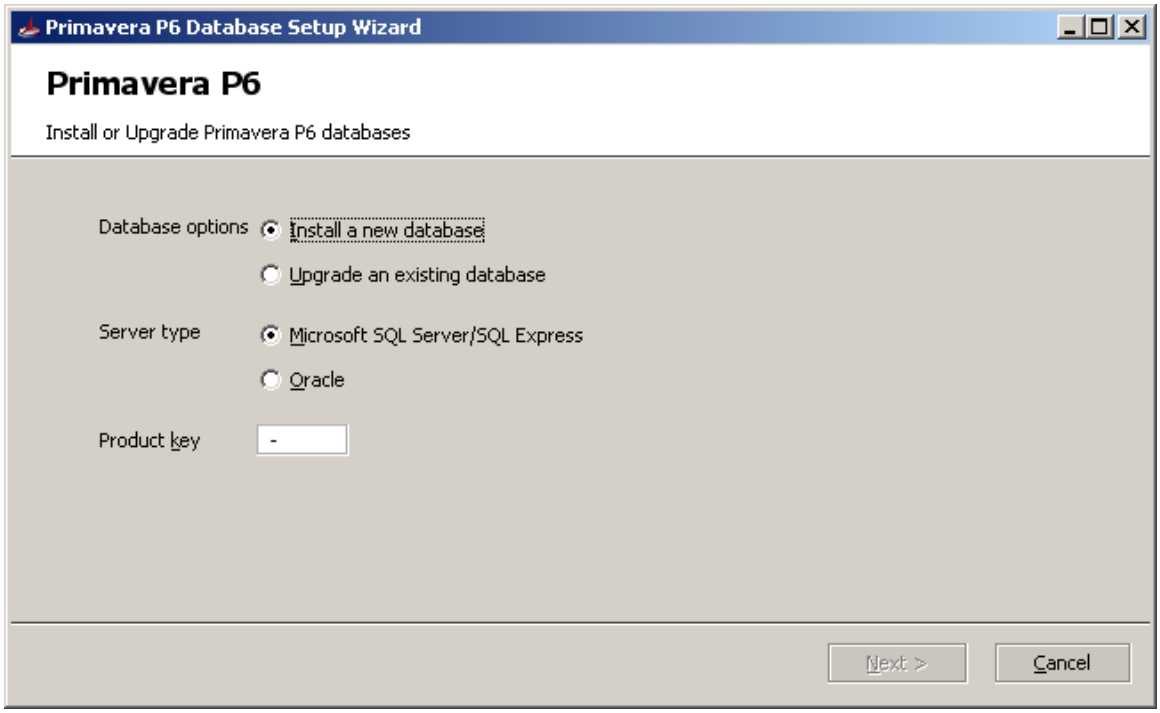
The Icarus Project Scheduler (IPS) product requires successful installation of a number of Primavera products in order to function. Although the Primavera documentation provides all the necessary information for installation, the information is distributed over various unrelated documents, and, often, not readily available. A brief summary is presented here to summarize the essential requirements for the Aspen IPS product to function. This is not intended to replace the Primavera documentation, and the sole purpose of providing this summary information is to provide Aspen In-Plant Cost Estimator/IPS users with a checklist of installation requirements. For further details, consult the appropriate Primavera documentation.

Installation Steps and Sequence

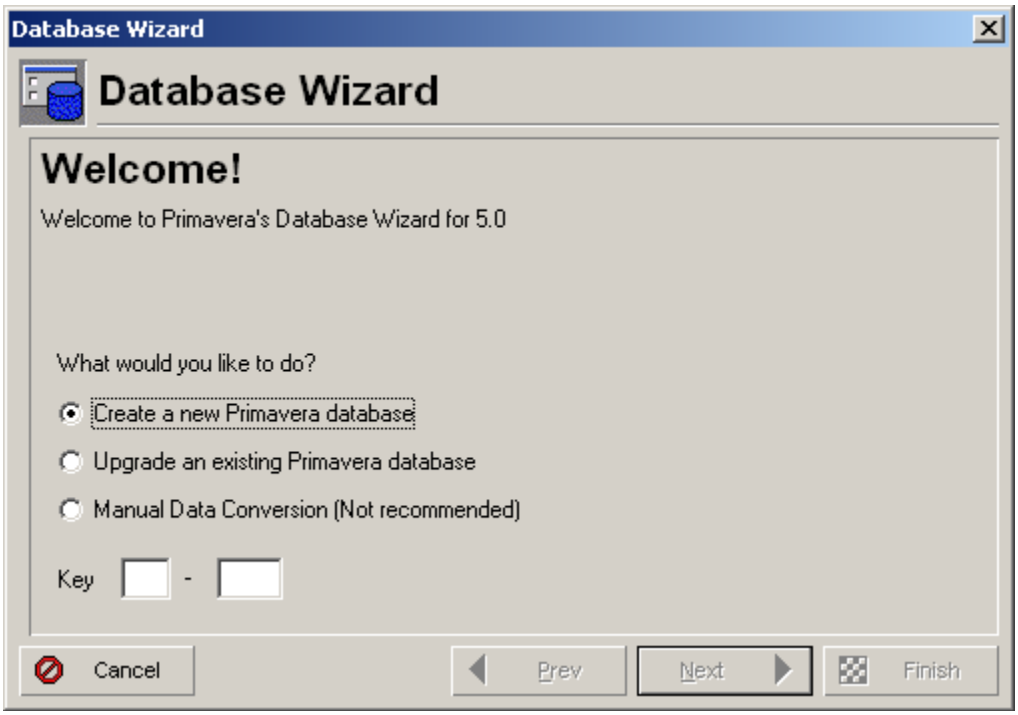
Primavera Project Management (P3E) stores scheduling data into the SQL Server/Oracle database (default database name is PMDB).
A successful installation of P3E and Integration API would require the following steps in order:

1. **Install database and load application data**
   The latest version of Primavera Project Management (version 6.0 and above) software includes SQL Server Express 2005. This can be installed by running **setup.exe** in the SQLSERVER directory. It can also be installed by selecting ***Primavera-Standalone option*** when prompted during installation step (see step 2 below). Selecting this option also installs client applications, an empty database and sample data (optional). If you already have the database server installed, you can use the P3E database wizard for creating a new database structure and loading the application data into the database. You can run the Database wizard to create a new database from a client computer that has the Microsoft SQL Server client or Oracle installed or Primavera Project Manager client

application (version 4.0 and above), or you can run the wizard from the server itself. The Database wizard creates any necessary file structures and users for you. The project manager database (PMDB) stores the project manager data used by Primavera Enterprise. Installation of the database is required.
This wizard can be run by executing **dbsetup.bat** file (located in the install\database directory) in Primavera Project Management Application Version 6.0 and above.

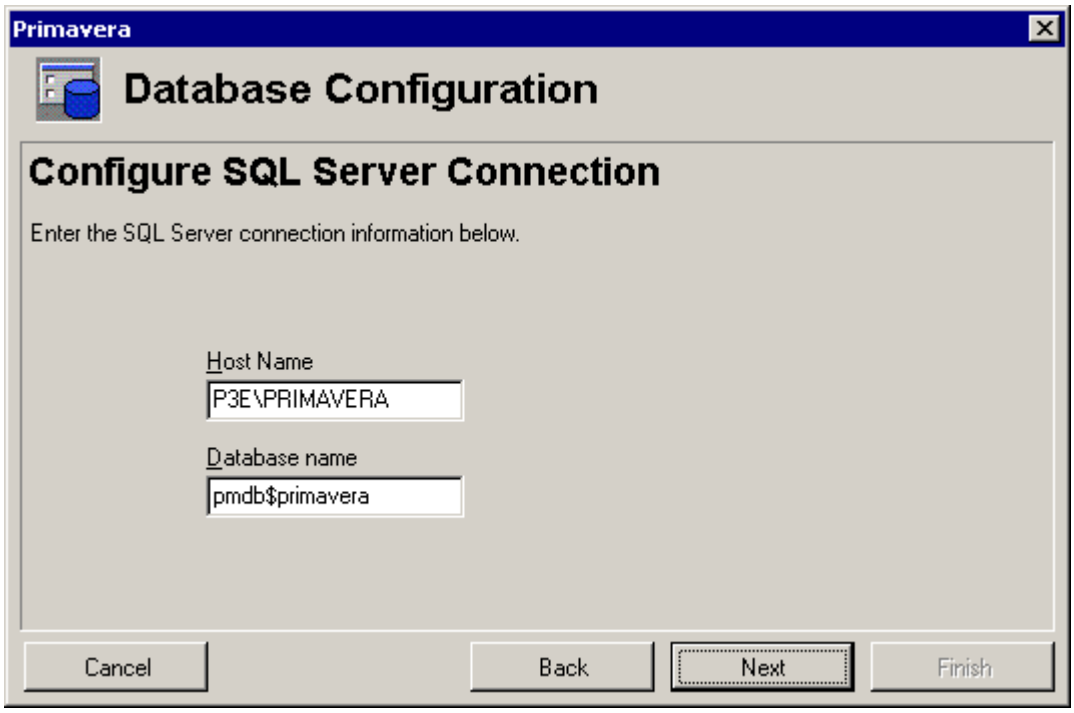


Use **ConfigAsst.exe** (located in the install\database directory) to invoke the database wizard for version prior to Primavera Project Management Application Version 6.



2. **Install the Primavera Project Manager Enterprise Client Application and configure database**
   After installing the Primavera database in step 1, install the Primavera Project Manager Enterprise Client application, by running the Setup wizard. The application requires approximately 23 MB of disk space. Administrator rights are required to install the Primavera client application.
   Selecting the **Custom** option when prompted lets you install Project Management and Job service.

   On the **Configure SQL Server Connection** dialog box or the **Configure Oracle Connection** dialog box, enter the database connection settings. If you are configuring Microsoft SQL Server or SQL Server Express, type the database host name and database name. The database name was specified when the database was created; for example, PMDB. The host name is the name of the computer or IP address where Microsoft SQL Server is installed. If you are configuring Oracle, type the Oracle database name.
   The screenshot below shows an example for configuring database connection for SQL Server.



Where,

Host Name: P3E\PRIMAVERA

P3E: System name where SQL Server is running

PRIMAVERA: SQL Server instance name.

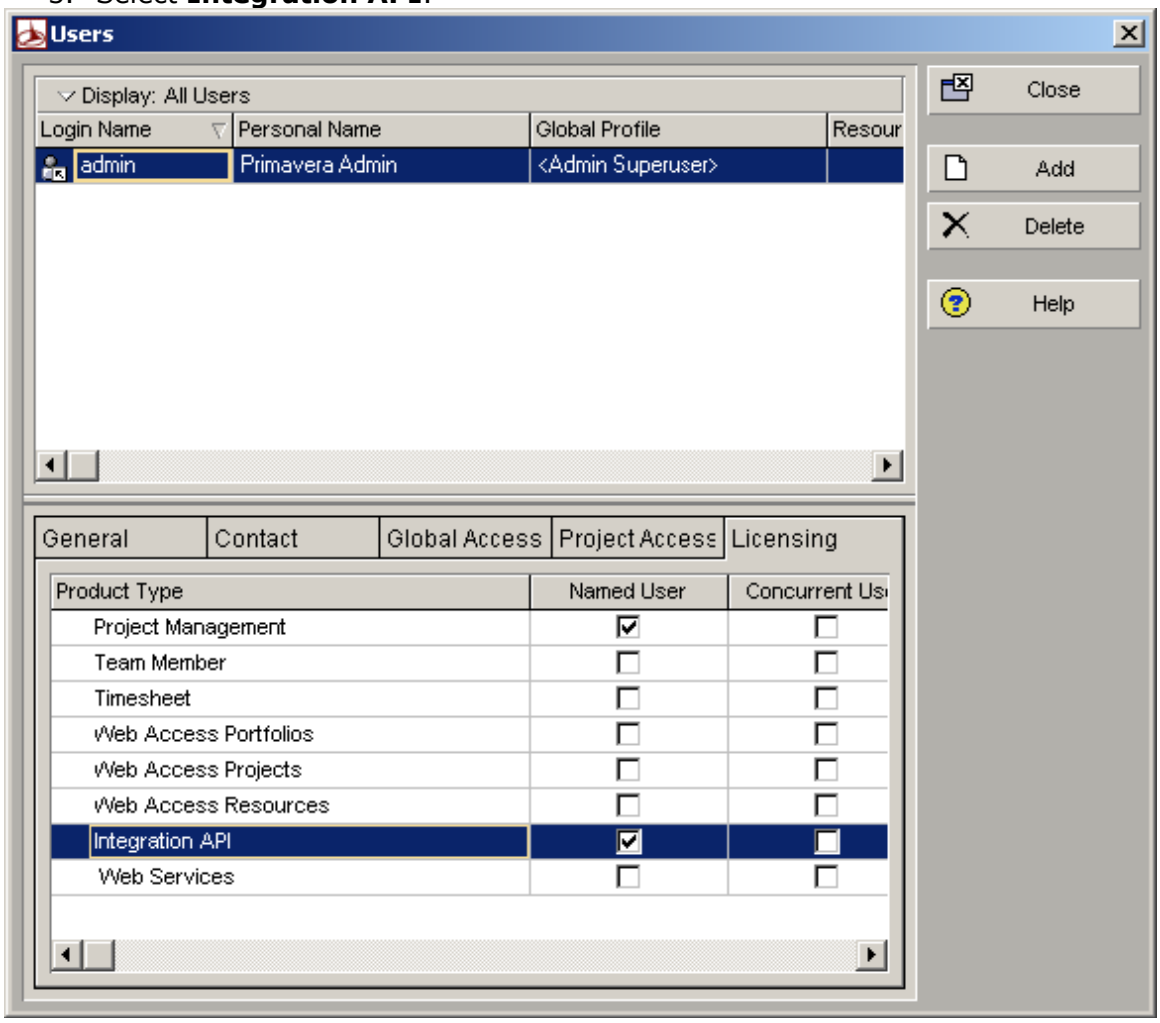
Database name: PMDB$PRIMAVERA

PMDB: Name of the database created during step 1 on PRIMAVERA SQL Server.

3. **Install the Primavera Job Service**
   If the Primavera Job Service component is not installed in step 2, install it by running the setup wizard again. The Primavera Job Service lets you configure scheduling, summarizing, exporting, and applying actual operations to run in the background. The Primavera Job Service runs as a Windows NT/2000 service and can support an unlimited number of jobs, each with its own schedule of execution. Jobs are defined in Project Manager and stored in the enterprise's project manager database. If you are working with more than one project manager database, you can run jobs for all of the databases from one Windows NT/2000 server. If you do not have a Windows NT or 2000 service, you will not have the project scheduled after loading from the IPS software. Then, you must manually use the **Tools | Options | Preferences | Schedule** menu in the Project Manager application.
4. **Configure Primavera Project Management Application**
   Have the Primavera administrator configure the licenses to allow access to both the Primavera Project manager and the integration API. The Primavera enterprise user licensing can be modified using the **Admin | Users** menu item in Primavera Project Management application. Corresponding licenses should also be available.

Follow the steps below to configure Primavera Project Management to use Primavera Integration API:

1. Open and login to Primavera Project Management application.
2. Click the **Admin | Users** top level menu item
3. Select **Integration API**.

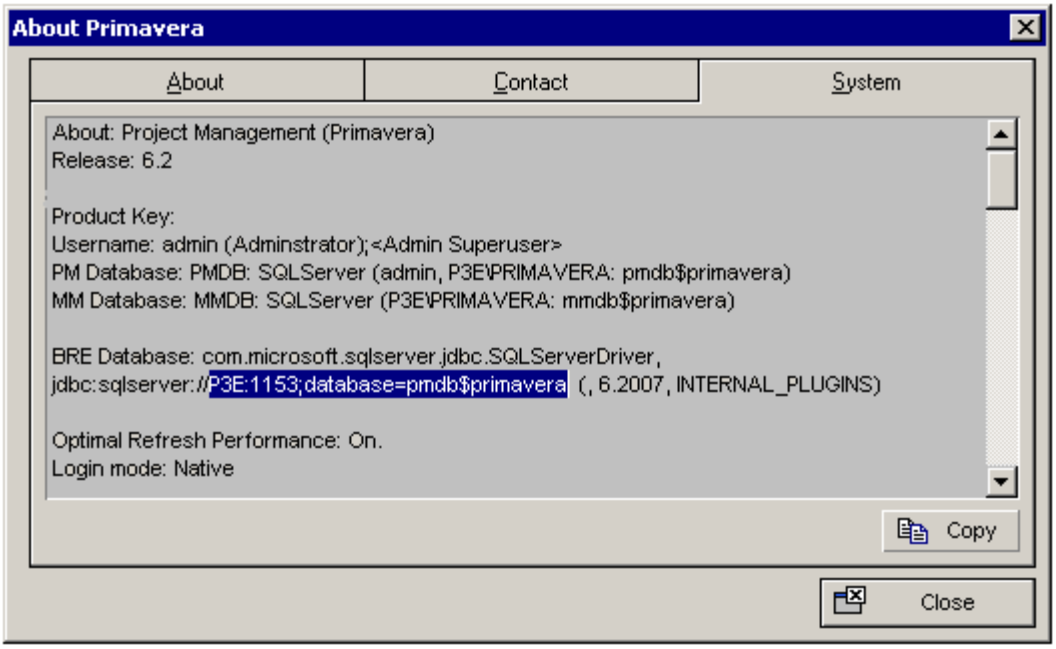


5. **Know your SQL Server database port**

The SQL Server database host port is required while configuring Primavera Integration API.

To identify Database Host Port perform following steps

1. Open and login to Primavera Project Management application.
2. Click **Help | About Primavera**.
3. The **System** tab in the **About Primavera** dialog displays username, database name, SQL Server name, SQL Server Database Host Port. For example, 1153 is the Database Host port as shown below



6 Install the Java Runtime Environment or Java Development Kit

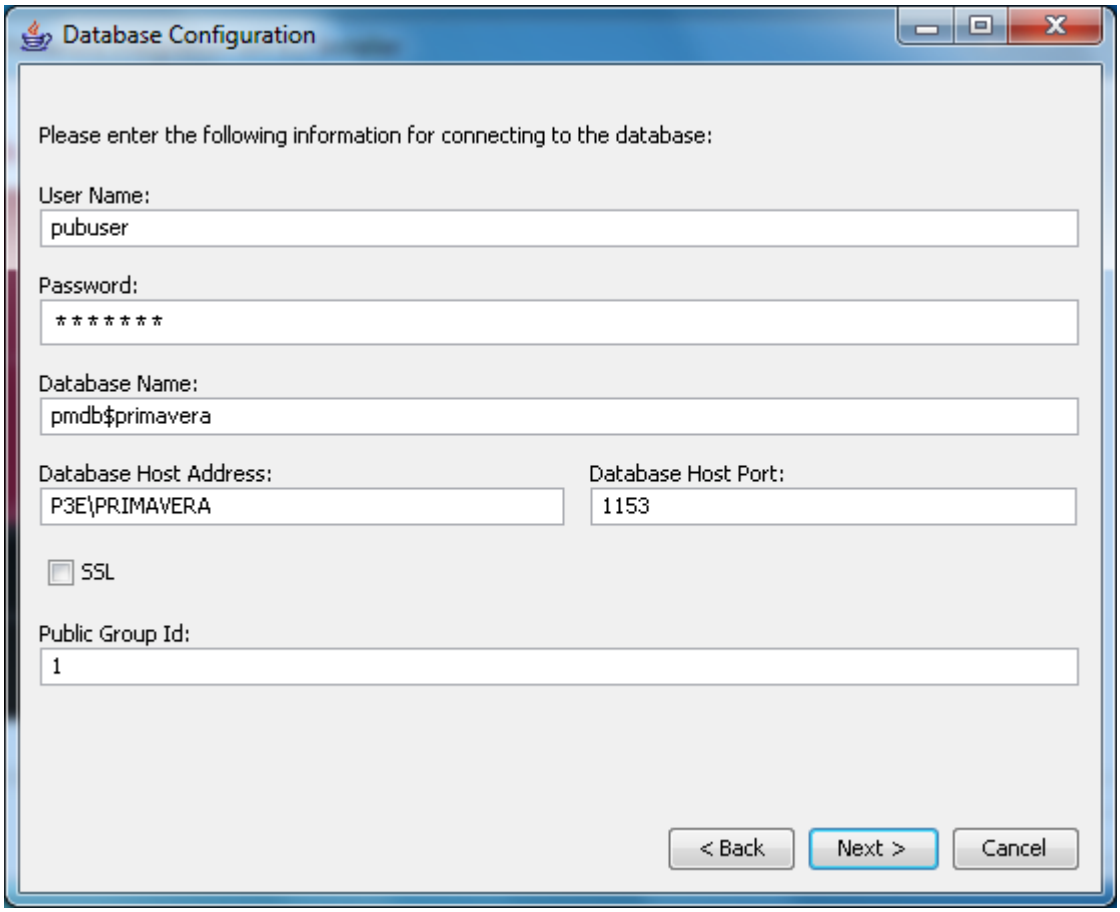
A copy of JRE (Java Runtime Environment) is included in the install\database directory. JRE or JDK (Java Development Kit) can also be downloaded from the Sun Microsystems Web site. If you are using the Java SDK, ensure that it is installed before running the **Integration API** setup. It is essential that the JDK be installed in a directory that does not have spaces in its name. Presumably this limitation will be removed shortly.

During installation of Java Integration API, a suitable Java Virtual Machine (JVM) needs to be specified by selecting its **java.exe** file from the java installation (bin) directory.

7 Install the Integration API

Go to the root folder of the Integration API Installation CD-ROM; double click **setup.exe**. Specify the installation mode to be **Local Mode**, using it without the Java RMI. Specify the database type to be the same as what you installed earlier. Specify the database connection parameters. The first time you install the Integration API, choose **Create a new configuration**. This is necessary to support the addition of new configuration settings for the release.

Use the database configuration wizard to configure the Integration API license.



Where,
Default User Name: pubuser
Default Password: pubuser
Database Name: Same as in step 2 above
Database Host Address: Same as in step 2 above
Database Host Address: From step 5 above.

8 Configure User, Password and API location in the Aspen Capital In-Plant Estimator/IPS Application.

After successful installation of the P3E enterprise client and the Integration API, it is necessary to provide information regarding the P3E user name, password, and the location of installation of the Integration API in the client machine (since IPS only supports local mode installation of the API). All three data may be added to the IPS through the use of **Tools | Options | Preferences | Schedule** menu, or changed inside a project by adding to the Primavera Project information tab in the Project basis tab of the IPS and Aspen In-Plant Cost Estimator products.

System Requirements for the Integration API

The Primavera Integration API has the following system requirements for local mode installation:

- **Java Runtime Environment**
  JRE 1.4 or higher (developers will require Java SDK 1.4 or higher, which includes the JRE)
  You can download the JRE or Java SDK from the Sun Microsystems Web site. If you are using the Java SDK, ensure that it is installed before running the Integration API setup. Install it in a directory without blanks in the names.
- **Operating Systems**
  The Primavera Integration API is fully supported on Windows operating systems.
- **Project Manager Database**
  Primavera version 4.0 or higher, and a Project Manager database (Oracle, and SQL Server are supported) are required. Either a SQL Server or Oracle client must be installed on the machine or, alternately you can install the database from the server machine.

Primavera Enterprise Client and Server Requirements

- Supported Platforms for Primavera Enterprise Client Applications
  - Microsoft Windows 98 Second Edition
  - Microsoft Windows NT 4.0 (SP6a recommended)
  - Microsoft Windows 2000, (SP1, SP2)
  - Microsoft Windows XP
  - Microsoft Windows Vista, 7.0 (32-bit)
- Minimum Client Configurations
  For clients running Project Manager:
  - 128 MB of RAM, 256 MB free recommended
  - 40 MB of hard-disk space (per application)
  - Microsoft Internet Explorer 5.0.1
  - Netscape Communicator 4.75
  - TCP/IP network protocol

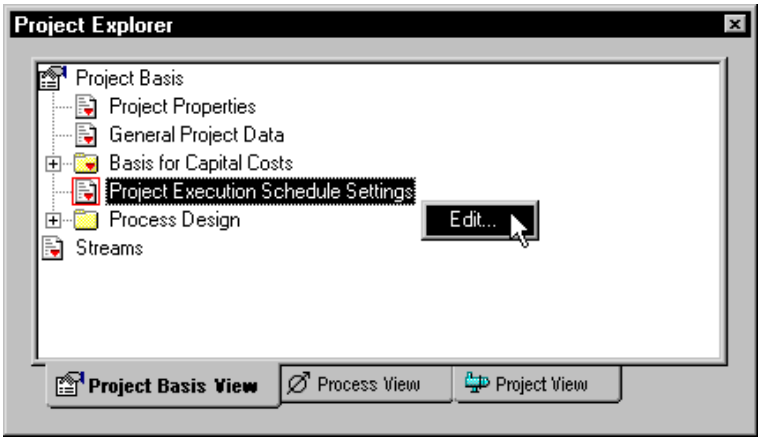
Defining Schedule Organization

To define the basic organization of the schedule, enter the Project Execution Schedule Settings and select components for which to include detailed scheduling data.

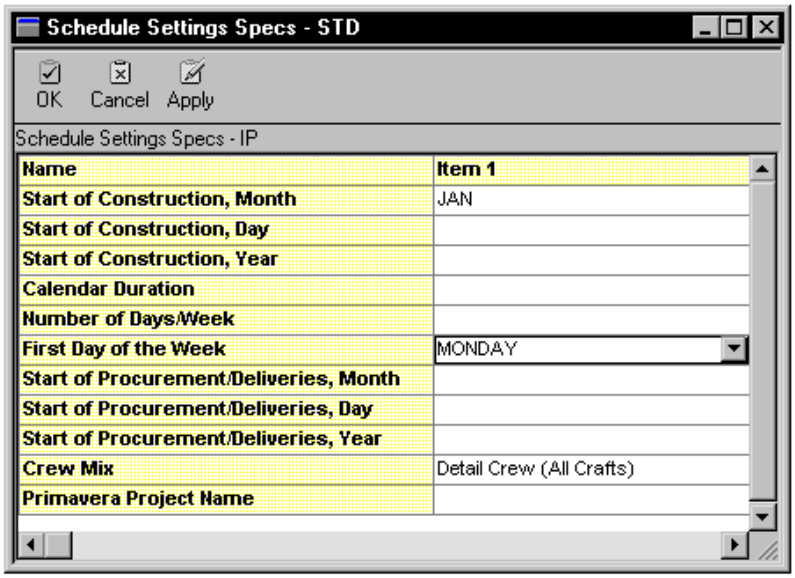
Project Execution Schedule Settings

To enter Project Execution Schedule Settings:

1 In Project Explorer's Project Basis view, right-click on Project Execution Schedule Settings and then click Edit.



Aspen In-Plant Cost Estimator displays a specifications form for Schedule Settings in the Main Window.



2 Enter the construction start date, including the month, day and year. The current date is used as the default.

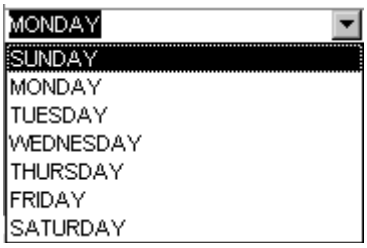
- Month: The month in which construction will start. Select a month from the drop-down menu.
- Day: The day of the month on which construction will start. Select a value 1 - 31, corresponding to the days of the month.
- Year: The last two digits of the year in which construction will start.

3 In the Calendar Duration field, enter the duration of the project in years (1-20). **Note**: This field is not in use.

4 Define the work week:

5 Select the number of days in the work week.

6 Select the first working day of the week.



7 Define the procurement and deliveries start date, including month, day and year. If the schedule is to include cost tracking, the date defaults to three months prior to the current date. If the schedule does not include cost tracking, the current date is used as the default.

- Month: The month in which procurement/deliveries will start. Select a month from the drop-down menu.
- Day: The day of the month on which procurement/deliveries will start. Select a value 1 - 31, corresponding to the days of the month.
- Year: The last two digits of the year in which procurement/deliveries will start.

8 In the Crew Mix field, select the summary level for the crew mix.

Option	To do this
Detail Crew (All Crafts)	Use all 29 crafts in the schedule.
General Crew (Acct. Level)	Summarize the crew mix by account level (equipment setting, piping, civil, steel, instrumentation, electrical, insulation and paint.)

9 If you are using Primavera as your scheduling program, enter the 4-character Primavera Project Name that Aspen In-Plant Cost Estimator will generate when you develop schedules and cost reports. The default project name is DFLT.

10 Click **OK** to save the specifications and close the form.

Selecting Components for Detailed Scheduling

By default, all project components in the preliminary schedule sent to the scheduling program are merged into activities by account (equipment and setting, piping, civil, steel, instrumentation, electrical, insulation and paint). However, Aspen In-Plant Cost Estimator lets you select components for which you wish to include detailed scheduling data.

To select a component for detailed scheduling:

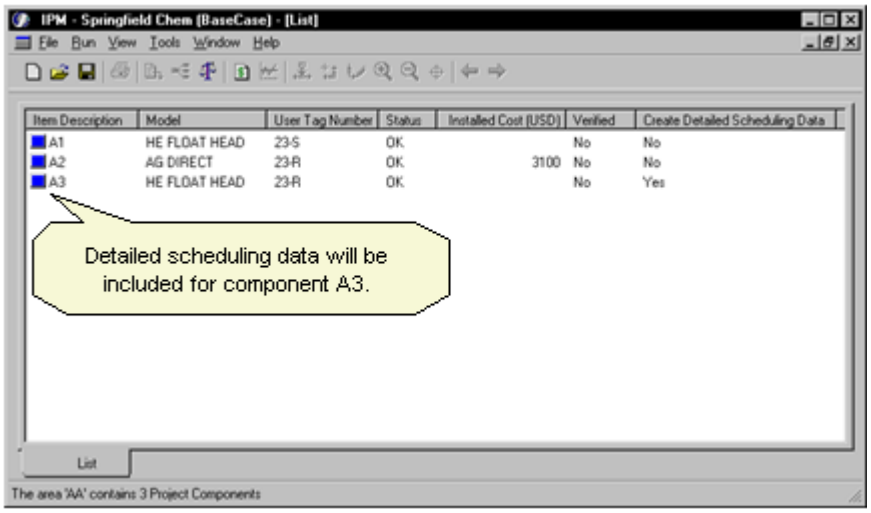
1 Right-click on the component either in Project Explorer's Project view or in the List window.

If the component has already been selected for detailed scheduling, a check mark (✓) appears next to **Create Detailed Scheduling Data**, the last option on the pop-up menu. In the example shown below, the component has not yet been selected for detailed scheduling.

2 Click Create Detailed Scheduling Data.

Detailed scheduling data will now be included for the component.

Note: The **List** window indicates whether or not a component has been selected for detailed scheduling. When the List view is at component level, this is indicated in the row for Create Detailed Scheduling Data. When the List view is at area level, this is indicated in a column for Create Detailed Scheduling Data, as shown below.


IPM - Springfield Chem (BaseCase) - [List]
File Run View Tools Window Help
Item Description
Model
User Tag Number
Status
Installed Cost [USD]
Verified
Create Detailed Scheduling Data
A1 HE FLOAT HEAD 23-S OK No No
A2 AG DIRECT 23-R OK 3100 No No
A3 HE FLOAT HEAD 23-R OK No Yes
Detailed scheduling data will be included for component A3.
List
The area 'AA' contains 3 Project Components

You can simultaneously mark multiple components for detailed scheduling.

To simultaneously mark multiple components for detailed scheduling:

1 Select the components in the **List** view (area level).

2 Right-click one of them.

3 Click **Create Detailed Scheduling Data** on the pop-up window.

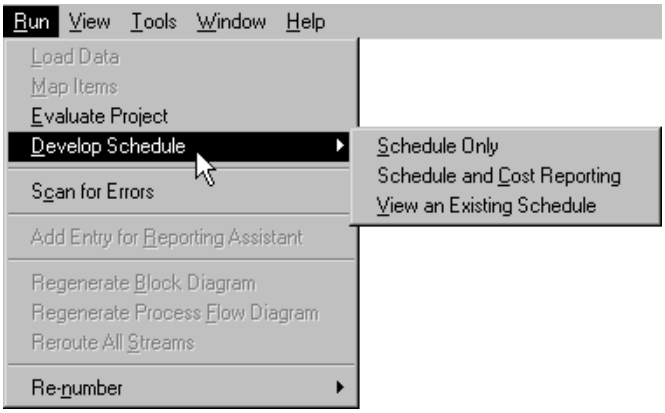
Sending the Preliminary Schedule to Your Scheduling Program

You are now ready to develop your schedule in your scheduling program.

To generate the schedule and launch your scheduling program:

1 Click **Develop Schedule** on the **Run** menu.

A sub-menu appears.



2 Click the desired option:

Click	to do this
Schedule Only	Develop a schedule.
Schedule and Cost Reporting	Develop a schedule with cost tracking.
View an Existing Schedule	Open a previously developed schedule.

Aspen In-Plant Cost Estimator launches your scheduling program. If you selected one of the first two options above, the program will display the current project's preliminary schedule (either with or without cost tracking, depending on your selection) for further development. If you selected the last option, the program lets you select an existing schedule.

Working with the Schedule

Aspen In-Plant Cost Estimator automatically develops a preliminary schedule for construction based on the scope of work from the project estimate

The schedule uses the same field crews (crafts, crew mix, craft productivities and wage rates) and work week (hours per week and shifts per day) as the estimate.

The schedule is influenced by your man-hour indices, by Codes of Account, and by man-hour percentage adjustments by component.

Crew sizes are adjusted to the amount of each activity.

- Activities are labeled with activity codes and ID's and are dynamically linked to one another in an activity network.
- All schedules begin with "Site Development" and end with "Testing & Demobilize."
- Most activities include an associated capital budget and expenditure curve to allow for cost tracking.

When requested, the preliminary schedule is automatically loaded into the scheduling program where it may be viewed, added to and/or revised to account for site constraints and to generate the actual execution plan.

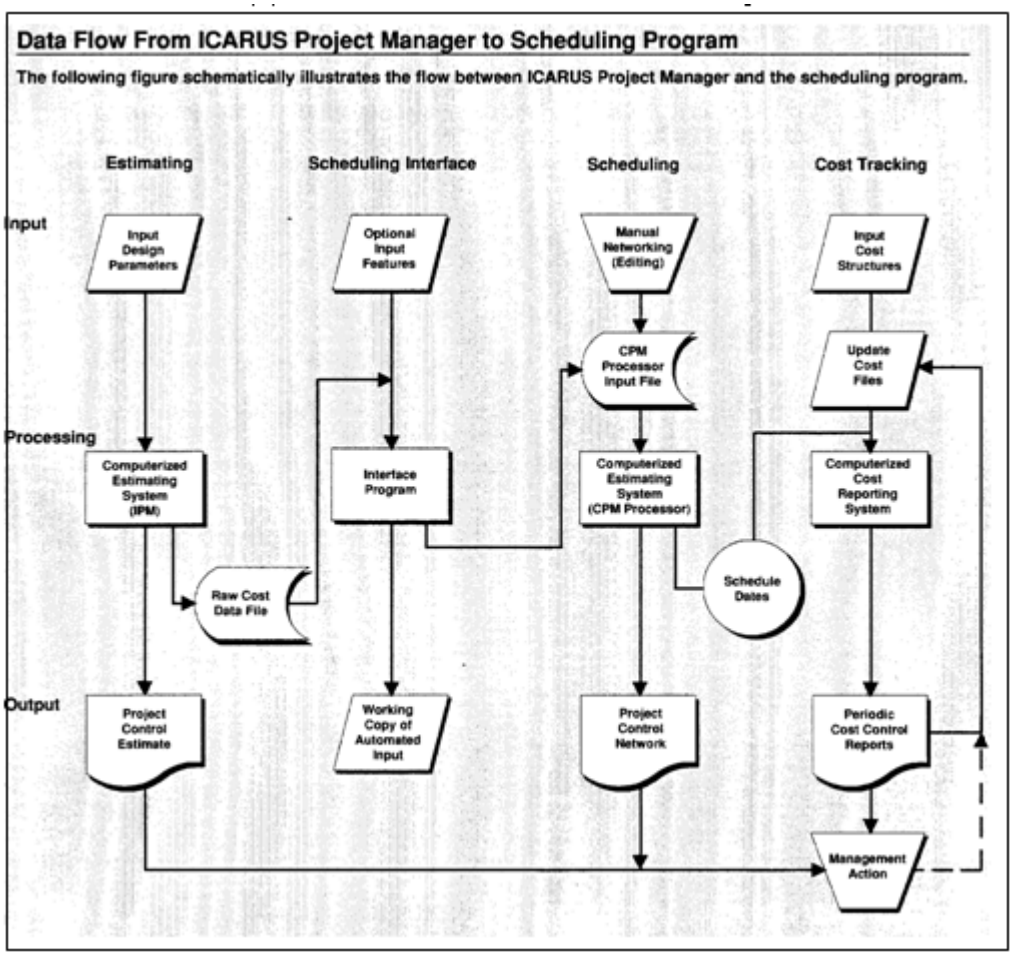
A capital cost expenditure plan is tied to the estimate. By periodically entering the percent completion for each activity and the actual expenditure, you may produce a variety of schedule and cost tracking/projection reports. The reports are suitable for managing a project to keep it on-schedule and within budget.

The preliminary schedule includes:

- Shipment of equipment and bulk items.
- Transport of items from laydown/storage area to construction site.
- Field erection/fabrication and testing of equipment.
- Field installation and testing of bulk items.
- Direct construction, rental equipment and operators required for installation of equipment and bulks.
- Field installation crews and foremen.

The preliminary schedule does not include:

- Basic and Detail Engineering by the owner of contractor (vendor's engineering is included in the estimated cost of shop fabbed equipment).
- Procurement fab and ship times.
- Home office support.
- Field office support.
- Field discipline, subcontractor superintendents.
- Construction, rental equipment not required for installation of components (for example., no construction trailers).
- Plant start-up, calibration and commissioning.



Logic Network of Activities

Aspen In-Plant Cost Estimator uses its built-in-scheduling logic to dynamically develop an activity network starting with "Site Development" and ending with "Testing and Demobilize." The diagram on page 290, "General Schematic of Scheduling Logic," illustrates the overall logic used. The unique feature of the system is that predecessors are established dynamically. That is, an activity is not dumbly linked to the immediate successor in the activity chain because it might not exist in this project. Rather, the system searches backward along the whole length of the activity chain to find the next available successor. In the worst case, "Mobilize," the first successor for all chains, is found and linked to. This insures that an unbroken activity network is always developed.

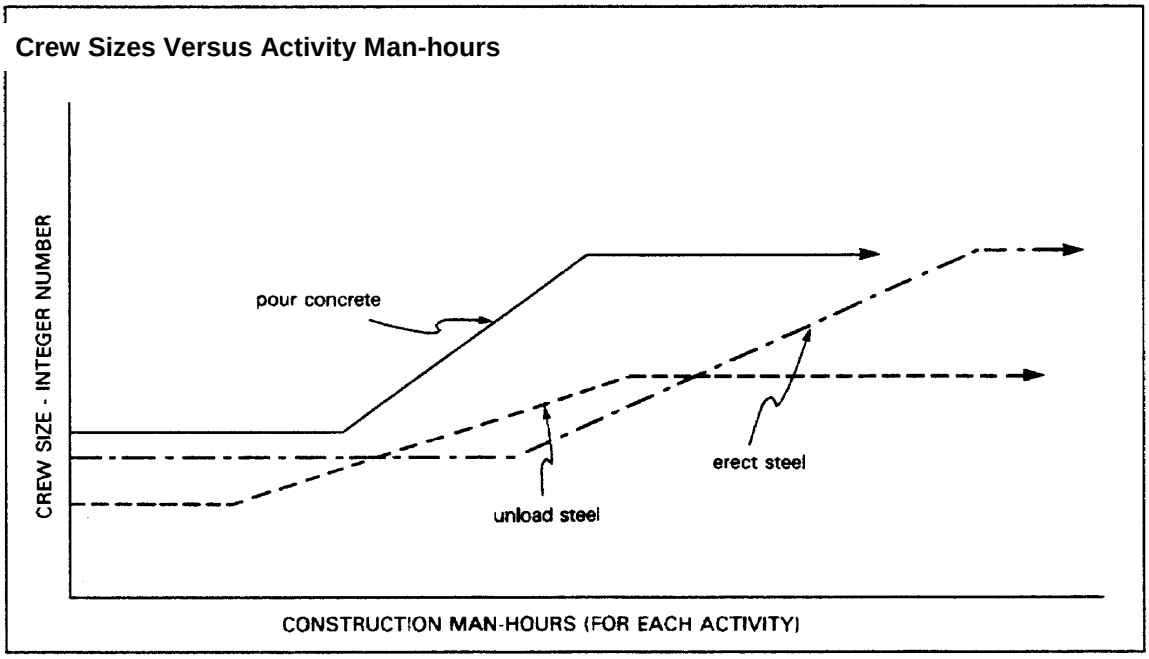
Duration of Activities

After work items have been rolled up into activities, the duration of each activity must be developed. To do this, the crews must be sized. The craft mix in the crew is already established as a result from summing all the individual craft percentages in all the rolled up work items. The crew is now sized according to the approach depicted in the diagram below.

Below the first break point, there is only a small amount of the activity (few total man-hours) so the system develops the minimal sized crew. The Crew size is kept constant with increasing amount of activity until the first break point when the system increases the size of the crew (men/crew) to avoid adding duration to the schedule.

Crew size continues to increase with activity amount until the second break point is reached, beyond which enlarging the crew size is not practical. Rather, it is assumed that the activity will simply take more calendar time to complete.

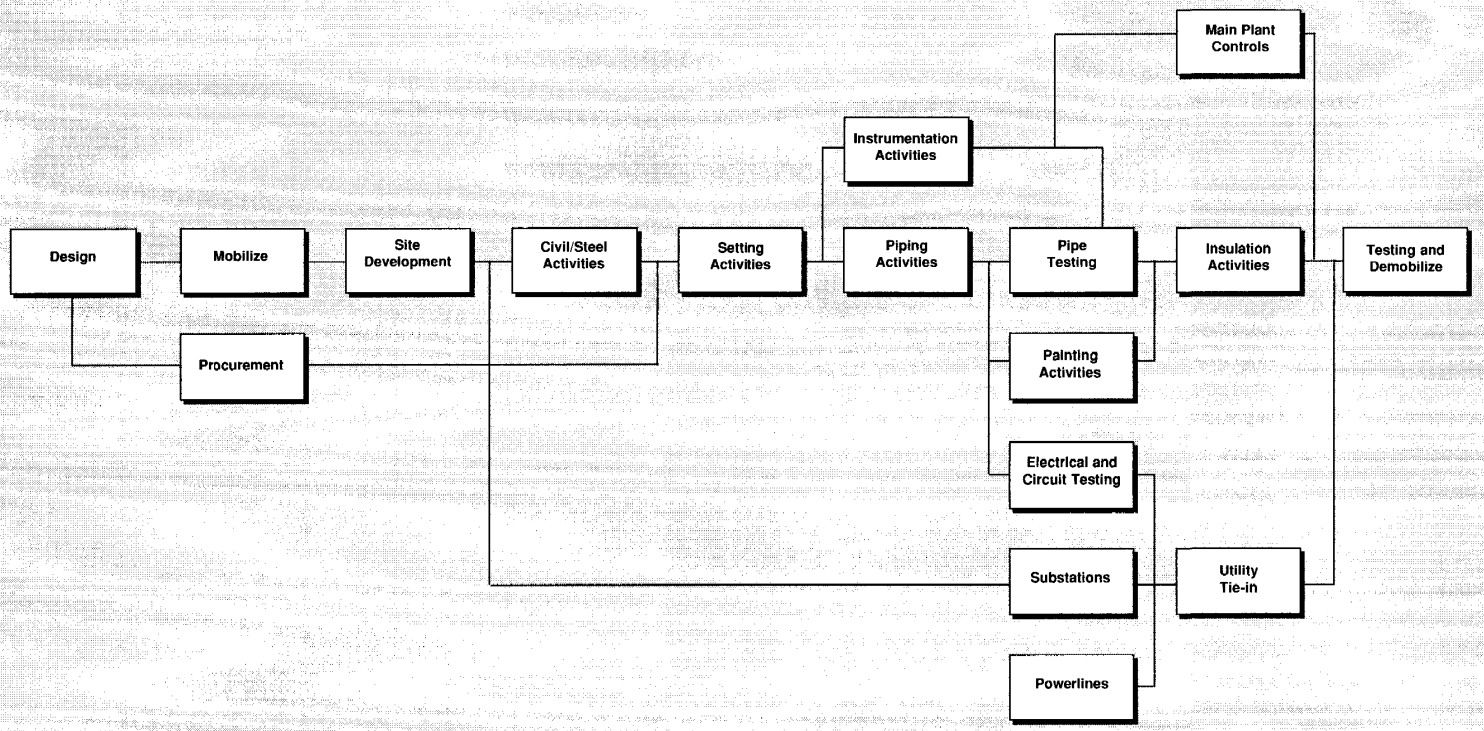
Although each activity in the system has its own curve with different properties, the principle is the same for each. Furthermore, each activity is treated this way in isolation and it is assumed there is no constraint on the availability of crafts (for example, if you add more shifts, the extra craft labor is assumed to be available). This means that no attempt is made to balance requirements or level the manpower load at this point. Capability is left to the detailed scheduling phase.



General Schematic of Scheduling Logic

ICARUS Project Manager uses built-in scheduling logic to dynamically develop an activity network. The illustration shown here indicates the overall logic that is used.

All ICARUS Project Manager schedules begin with *Site Development* and end with *Testing and Demobilize*.



Preliminary Schedule

Aspen In-Plant Cost Estimator makes a forward pass through the activity network to establish early start dates and then a backward pass to establish early finish dates. From these lags, the critical path is developed. The resulting activities, associated activity codes, manpower resources, dates and logic are then automatically loaded into the scheduling program.

An analysis of the manpower resources budgeted by craft demonstrates that within differences due to rounding, the schedule contains the same man-hours as the estimate.

Layout Views – Primavera Project Planner (P3)

Aspen In-Plant Cost Estimator incorporates eight Primavera Project Planner (P3) layout views into the project schedule. These layout views are a perspective or view of a project and determine the organization and look of a project when it appears on the monitor. A description of the layout views follows.

Note: Refer to the scheduling program's documentation for further information on utilizing the layout views.

Layout	Description
Account Group, Code of Account	Organized by account group (i.e., site development, plant bulks, and so on) and code of account.
Component Type, Account	Organized by component type (i.e., equipment, plant bulks, and so on) and code of account.
Critical Path	All items on critical path are listed first and the remainder of activities organized by float beginning with 0 float items.
Weekly Schedule	Organized by week.
Location, Account Group	Organized by area location and account group within each area
Resource Layout	Organized by resource followed by tasks assigned to that resource.
Resource Status Report	A resource tracking report with user inputs to apply to each resource such as percent complete, resource/cost percent complete, actual start date and actual finish.
Activity ID	Organized by activity ID

Layout Views – Primavera Project Management (P6)

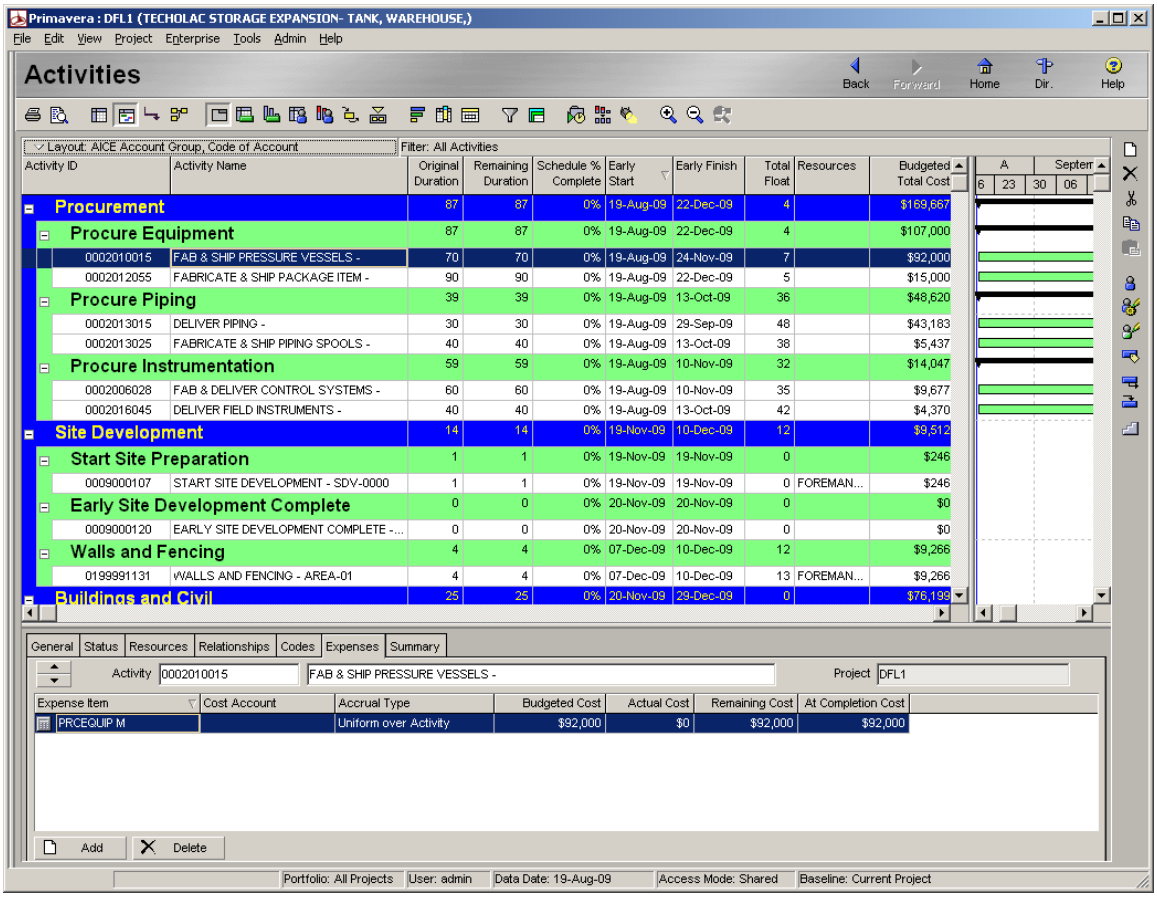
Aspen In-Plant Cost Estimator incorporates four layout views for Primavera Project Management (P6). These layout views are a perspective or view of a project and determine the organization and look of a project when it appears on the monitor.

A description of the P6 layout views follows.

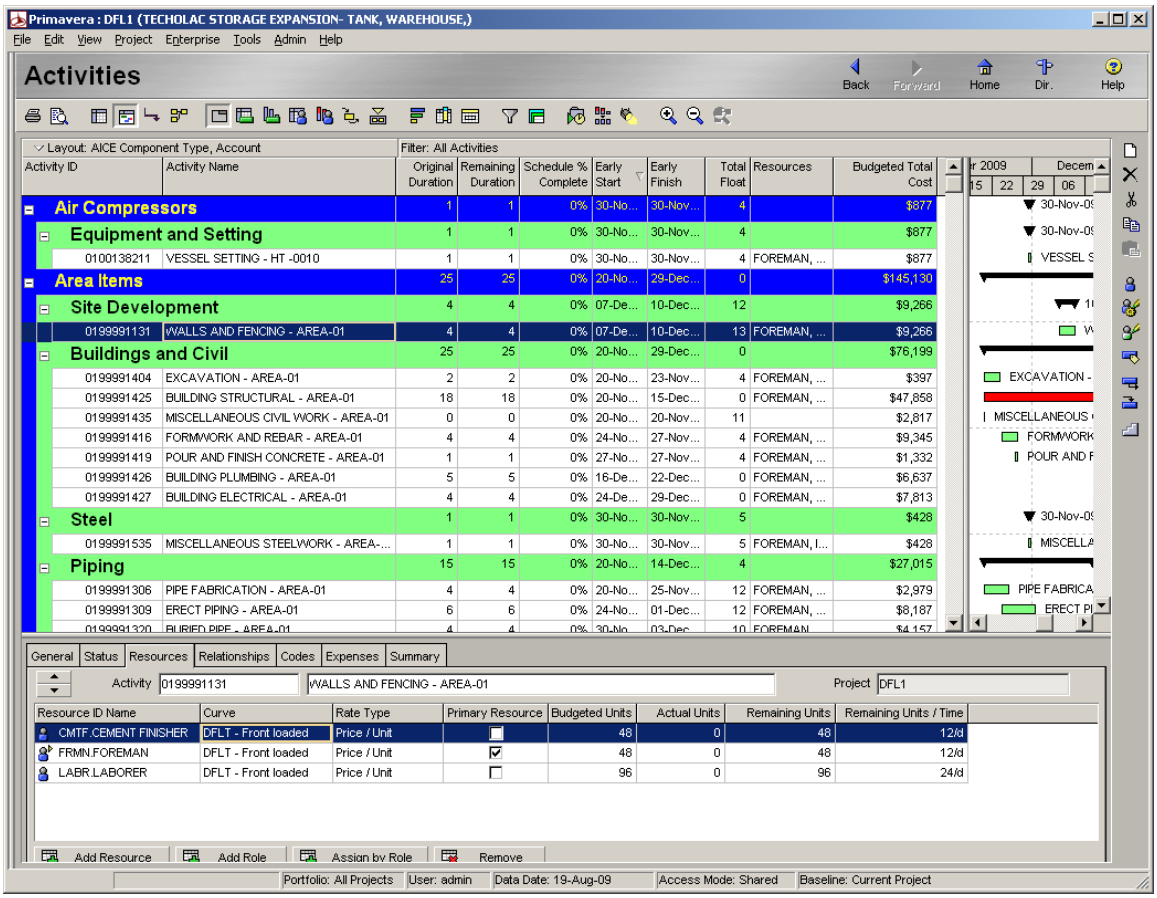
Layout	Description
Account Group, Code of Account	Organized by account group (that is, site development, plant bulks, and so on) and code of account
Component Type, Account	Organized by component type (that is, equipment, plant bulks, and so on) and code of account.
Location, Account Group	Organized by area location and account group within each area
Activity ID	Organized by activity ID

These layouts are located in the **...\AspenTech\Shared Economic Evaluation V7.3\Schedule\Layouts** directory and should be imported to Primavera Project Management application.

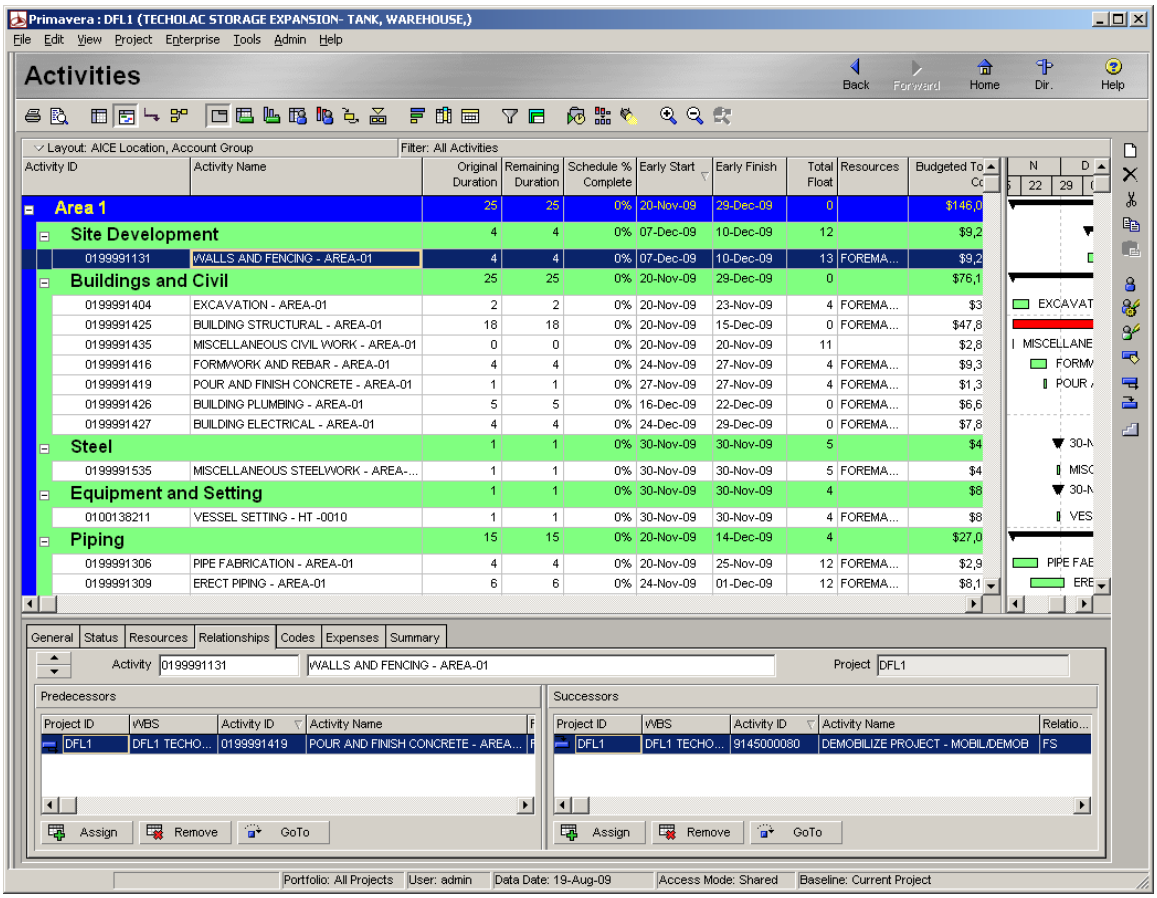
Account Group, Code of Account Layout View


Primavera : DFL1 (TECHOLAC STORAGE EXPANSION- TANK, WAREHOUSE,)
File Edit View Project Enterprise Tools Admin Help
Activities
Back Forward Home Dir. Help
Layout: AICE Account Group, Code of Account
Filter: All Activities
Activity ID | Activity Name | Original Duration | Remaining Duration | Schedule % Complete | Early Start | Early Finish | Total Float | Resources | Budgeted Total Cost
Procurement 87 87 0% 19-Aug-09 22-Dec-09 4 $169,667
Procure Equipment 87 87 0% 19-Aug-09 22-Dec-09 4 $107,000
0002010015 FAB & SHIP PRESSURE VESSELS - 70 70 0% 19-Aug-09 24-Nov-09 7 $92,000
0002012055 FABRICATE & SHIP PACKAGE ITEM - 90 90 0% 19-Aug-09 22-Dec-09 5 $15,000
Procure Piping 39 39 0% 19-Aug-09 13-Oct-09 36 $48,620
0002013015 DELIVER PIPING - 30 30 0% 19-Aug-09 29-Sep-09 48 $43,183
0002013025 FABRICATE & SHIP PIPING SPOOLS - 40 40 0% 19-Aug-09 13-Oct-09 38 $5,437
Procure Instrumentation 59 59 0% 19-Aug-09 10-Nov-09 32 $14,047
0002006028 FAB & DELIVER CONTROL SYSTEMS - 60 60 0% 19-Aug-09 10-Nov-09 35 $9,677
0002016045 DELIVER FIELD INSTRUMENTS - 40 40 0% 19-Aug-09 13-Oct-09 42 $4,370
Site Development 14 14 0% 19-Nov-09 10-Dec-09 12 $9,512
Start Site Preparation 1 1 0% 19-Nov-09 19-Nov-09 0 $246
0009000107 START SITE DEVELOPMENT - SDV-0000 1 1 0% 19-Nov-09 19-Nov-09 0 FOREMAN... $246
Early Site Development Complete 0 0 0% 20-Nov-09 20-Nov-09 0 $0
0009000120 EARLY SITE DEVELOPMENT COMPLETE -... 0 0 0% 20-Nov-09 20-Nov-09 0 $0
Walls and Fencing 4 4 0% 07-Dec-09 10-Dec-09 12 $9,266
0199991131 WALLS AND FENCING - AREA-01 4 4 0% 07-Dec-09 10-Dec-09 13 FOREMAN... $9,266
Buildings and Civil 25 25 0% 20-Nov-09 29-Dec-09 0 $76,199
A Septem 6 23 30 06
General Status Resources Relationships Codes Expenses Summary
Activity 0002010015 FAB & SHIP PRESSURE VESSELS -
Project DFL1
Expense Item | Cost Account | Accrual Type | Budgeted Cost | Actual Cost | Remaining Cost | At Completion Cost
PRCEQUIP M Uniform over Activity $92,000 $0 $92,000 $92,000
Add Delete
Portfolio: All Projects
User: admin
Data Date: 19-Aug-09
Access Mode: Shared
Baseline: Current Project

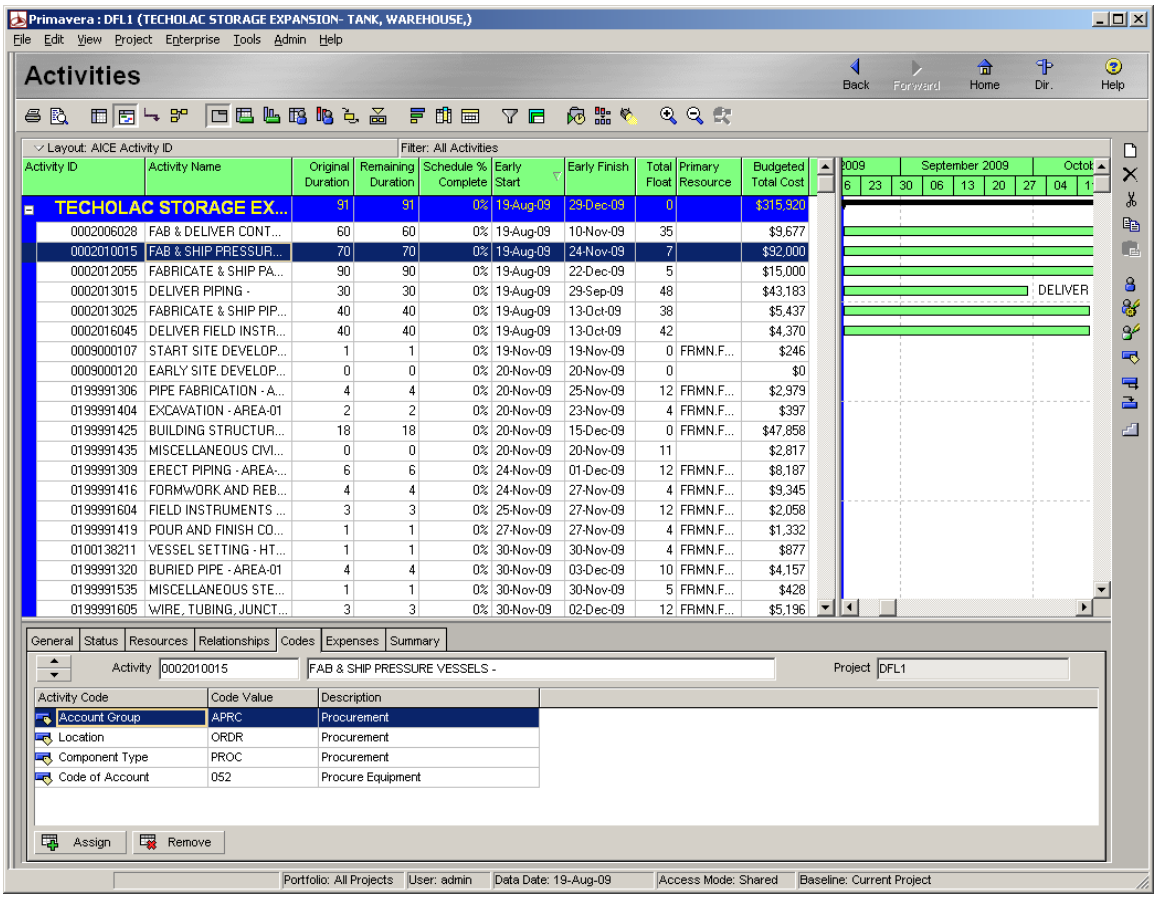
Component Type, Account Layout View


Primavera : DFL1 (TECHOLAC STORAGE EXPANSION- TANK, WAREHOUSE,)
File Edit View Project Enterprise Tools Admin Help
Activities
Back Forward Home Dir. Help
Layout: AICE Component Type, Account
Filter: All Activities
Activity ID | Activity Name | Original Duration | Remaining Duration | Schedule % Complete | Early Start | Early Finish | Total Float | Resources | Budgeted Total Cost
Air Compressors 1 1 0% 30-No... 30-Nov... 4 $877
Equipment and Setting 1 1 0% 30-No... 30-Nov... 4 $877
0100138211 VESSEL SETTING - HT -0010 1 1 0% 30-No... 30-Nov... 4 FOREMAN, ... $877
Area Items 25 25 0% 20-No... 29-Dec... 0 $145,130
Site Development 4 4 0% 07-De... 10-Dec... 12 $9,266
0199991131 WALLS AND FENCING - AREA-01 4 4 0% 07-De... 10-Dec... 13 FOREMAN, ... $9,266
Buildings and Civil 25 25 0% 20-No... 29-Dec... 0 $76,199
0199991404 EXCAVATION - AREA-01 2 2 0% 20-No... 23-Nov... 4 FOREMAN, ... $397
0199991425 BUILDING STRUCTURAL - AREA-01 18 18 0% 20-No... 15-Dec... 0 FOREMAN, ... $47,858
0199991435 MISCELLANEOUS CIVIL WORK - AREA-01 0 0 0% 20-No... 20-Nov... 11 $2,817
0199991416 FORMWORK AND REBAR - AREA-01 4 4 0% 24-No... 27-Nov... 4 FOREMAN, ... $9,345
0199991419 POUR AND FINISH CONCRETE - AREA-01 1 1 0% 27-No... 27-Nov... 4 FOREMAN, ... $1,332
0199991426 BUILDING PLUMBING - AREA-01 5 5 0% 16-De... 22-Dec... 0 FOREMAN, ... $6,637
0199991427 BUILDING ELECTRICAL - AREA-01 4 4 0% 24-De... 29-Dec... 0 FOREMAN, ... $7,813
Steel 1 1 0% 30-No... 30-Nov... 5 $428
0199991535 MISCELLANEOUS STEELWORK - AREA-... 1 1 0% 30-No... 30-Nov... 5 FOREMAN, I... $428
Piping 15 15 0% 20-No... 14-Dec... 4 $27,015
0199991306 PIPE FABRICATION - AREA-01 4 4 0% 20-No... 25-Nov... 12 FOREMAN, ... $2,979
0199991309 ERECT PIPING - AREA-01 6 6 0% 24-No... 01-Dec... 12 FOREMAN, ... $8,187
General Status Resources Relationships Codes Expenses Summary
Activity 0199991131 WALLS AND FENCING - AREA-01 Project DFL1
Resource ID Name | Curve | Rate Type | Primary Resource | Budgeted Units | Actual Units | Remaining Units | Remaining Units / Time
CMTF.CEMENT FINISHER DFLT - Front loaded Price / Unit 48 0 48 12/d
FRMN.FOREMAN DFLT - Front loaded Price / Unit 48 0 48 12/d
LABR.LABORER DFLT - Front loaded Price / Unit 96 0 96 24/d
Add Resource Add Role Assign by Role Remove
Portfolio: All Projects User: admin Data Date: 19-Aug-09 Access Mode: Shared Baseline: Current Project

Location, Account Group Layout View


Primavera : DFL1 (TECHOLAC STORAGE EXPANSION- TANK, WAREHOUSE,)
File Edit View Project Enterprise Tools Admin Help
Activities
Back Forward Home Dir. Help
Layout: AICE Location, Account Group
Filter: All Activities
Activity ID | Activity Name | Original Duration | Remaining Duration | Schedule % Complete | Early Start | Early Finish | Total Float | Resources | Budgeted To
Area 1 25 25 0% 20-Nov-09 29-Dec-09 0 $146,0
Site Development 4 4 0% 07-Dec-09 10-Dec-09 12 $9,2
0199991131 WALLS AND FENCING - AREA-01 4 4 0% 07-Dec-09 10-Dec-09 13 FOREMA... $9,2
Buildings and Civil 25 25 0% 20-Nov-09 29-Dec-09 0 $76,1
0199991404 EXCAVATION - AREA-01 2 2 0% 20-Nov-09 23-Nov-09 4 FOREMA... $3
0199991425 BUILDING STRUCTURAL - AREA-01 18 18 0% 20-Nov-09 15-Dec-09 0 FOREMA... $47,8
0199991435 MISCELLANEOUS CIVIL WORK - AREA-01 0 0 0% 20-Nov-09 20-Nov-09 11 $2,8
0199991416 FORMWORK AND REBAR - AREA-01 4 4 0% 24-Nov-09 27-Nov-09 4 FOREMA... $9,3
0199991419 POUR AND FINISH CONCRETE - AREA-01 1 1 0% 27-Nov-09 27-Nov-09 4 FOREMA... $1,3
0199991426 BUILDING PLUMBING - AREA-01 5 5 0% 16-Dec-09 22-Dec-09 0 FOREMA... $6,6
0199991427 BUILDING ELECTRICAL - AREA-01 4 4 0% 24-Dec-09 29-Dec-09 0 FOREMA... $7,8
Steel 1 1 0% 30-Nov-09 30-Nov-09 5 $4
0199991535 MISCELLANEOUS STEELWORK - AREA-... 1 1 0% 30-Nov-09 30-Nov-09 5 FOREMA... $4
Equipment and Setting 1 1 0% 30-Nov-09 30-Nov-09 4 $8
0100138211 VESSEL SETTING - HT -0010 1 1 0% 30-Nov-09 30-Nov-09 4 FOREMA... $8
Piping 15 15 0% 20-Nov-09 14-Dec-09 4 $27,0
0199991306 PIPE FABRICATION - AREA-01 4 4 0% 20-Nov-09 25-Nov-09 12 FOREMA... $2,9
0199991309 ERECT PIPING - AREA-01 6 6 0% 24-Nov-09 01-Dec-09 12 FOREMA... $8,1
N D
22 29
EXCAVAT
MISCELLANE
FORMW
POUR
PIPE FAE
ERE
General Status Resources Relationships Codes Expenses Summary
Activity 0199991131 WALLS AND FENCING - AREA-01 Project DFL1
Predecessors
Project ID | WBS | Activity ID | Activity Name
DFL1 DFL1 TECHO... 0199991419 POUR AND FINISH CONCRETE - AREA...
Assign Remove GoTo
Successors
Project ID | WBS | Activity ID | Activity Name | Relatio...
DFL1 DFL1 TECHO... 9145000080 DEMOBILIZE PROJECT - MOBIL/DEMOB FS
Assign Remove GoTo
Portfolio: All Projects
User: admin
Data Date: 19-Aug-09
Access Mode: Shared
Baseline: Current Project

Activity ID Layout View


Primavera : DFL1 (TECHOLAC STORAGE EXPANSION- TANK, WAREHOUSE,)
File Edit View Project Enterprise Tools Admin Help
Activities
Back Forward Home Dir. Help
Layout: AICE Activity ID
Filter: All Activities
Activity ID | Activity Name | Original Duration | Remaining Duration | Schedule % Complete | Early Start | Early Finish | Total Float | Primary Resource | Budgeted Total Cost
TECHOLAC STORAGE EX... 91 91 0% 19-Aug-09 29-Dec-09 0 $315,920
0002006028 FAB & DELIVER CONT... 60 60 0% 19-Aug-09 10-Nov-09 35 $9,677
0002010015 FAB & SHIP PRESSUR... 70 70 0% 19-Aug-09 24-Nov-09 7 $92,000
0002012055 FABRICATE & SHIP PA... 90 90 0% 19-Aug-09 22-Dec-09 5 $15,000
0002013015 DELIVER PIPING - 30 30 0% 19-Aug-09 29-Sep-09 48 $43,183
0002013025 FABRICATE & SHIP PIP... 40 40 0% 19-Aug-09 13-Oct-09 38 $5,437
0002016045 DELIVER FIELD INSTR... 40 40 0% 19-Aug-09 13-Oct-09 42 $4,370
0009000107 START SITE DEVELOP... 1 1 0% 19-Nov-09 19-Nov-09 0 FRMN.F... $246
0009000120 EARLY SITE DEVELOP... 0 0 0% 20-Nov-09 20-Nov-09 0 $0
0199991306 PIPE FABRICATION - A... 4 4 0% 20-Nov-09 25-Nov-09 12 FRMN.F... $2,979
0199991404 EXCAVATION - AREA-01 2 2 0% 20-Nov-09 23-Nov-09 4 FRMN.F... $397
0199991425 BUILDING STRUCTUR... 18 18 0% 20-Nov-09 15-Dec-09 0 FRMN.F... $47,858
0199991435 MISCELLANEOUS CIVI... 0 0 0% 20-Nov-09 20-Nov-09 11 $2,817
0199991309 ERECT PIPING - AREA-... 6 6 0% 24-Nov-09 01-Dec-09 12 FRMN.F... $8,187
0199991416 FORMWORK AND REB... 4 4 0% 24-Nov-09 27-Nov-09 4 FRMN.F... $9,345
0199991604 FIELD INSTRUMENTS ... 3 3 0% 25-Nov-09 27-Nov-09 12 FRMN.F... $2,058
0199991419 POUR AND FINISH CO... 1 1 0% 27-Nov-09 27-Nov-09 4 FRMN.F... $1,332
0100138211 VESSEL SETTING - HT... 1 1 0% 30-Nov-09 30-Nov-09 4 FRMN.F... $877
0199991320 BURIED PIPE - AREA-01 4 4 0% 30-Nov-09 03-Dec-09 10 FRMN.F... $4,157
0199991535 MISCELLANEOUS STE... 1 1 0% 30-Nov-09 30-Nov-09 5 FRMN.F... $428
0199991605 WIRE, TUBING, JUNCT... 3 3 0% 30-Nov-09 02-Dec-09 12 FRMN.F... $5,196
2009 September 2009 Octob
6 23 30 06 13 20 27 04
DELIVER
General Status Resources Relationships Codes Expenses Summary
Activity 0002010015 FAB & SHIP PRESSURE VESSELS -
Project DFL1
Activity Code | Code Value | Description
Account Group APRC Procurement
Location ORDR Procurement
Component Type PROC Procurement
Code of Account 052 Procure Equipment
Assign Remove
Portfolio: All Projects User: admin Data Date: 19-Aug-09 Access Mode: Shared Baseline: Current Project

Schedule Reports – P3 Only

Aspen In-Plant Cost Estimator creates five new reports in the scheduling program. These reports make use of the specific resources and cost codes in the network created by Aspen In-Plant Cost Estimator. A description of the reports follows.

Schedule	Report Description
Labor Resources per Activity	This tabular report lists the budget, percent complete, estimate to complete, forecast and variance for each activity.
Cost Summary by Account	This tabular report lists the labor resources used for each activity. For each activity and the resources within each activity, this report displays the budget, percent complete, estimate to complete, forecast and variance.
Direct Material – Cumul Cash Flow	This graphical report displays the direct material costs over the construction period.
Direct Labor – Cumul Cash Flow	This graphical report displays the direct labor costs over the construction period.
Direct Material & Labor-Cash Flow	This graphical report displays the direct material and labor costs over the construction period.

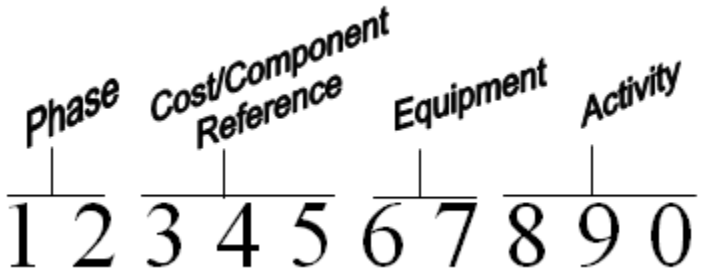
Understanding Activity IDs

Each activity is represented by a unique identification containing 10 numeric characters. It is important to understand the activity IDs if you wish to add activities, since the activity ID determines the precedence network and labor.

The activity ID is made up of 4 distinct sets of codes as identified below:

Code	Description
Phase	Indicates phase of construction.
Cost/Component Reference	Indicates cost or equipment reference.
Equipment	Indicates equipment.
Activity	Indicates activity.

The following figure identifies the placement of the codes in the activity ID.



A detailed explanation of the activity codes follows.

Phase Code

The Phase Code identifies when an activity takes place. Generally, the Phase Codes are as follows:

00 Prior to construction

01 During construction

91 After construction

See "Cost/Component Reference Code" below for examples of when Phase Code deviates from these guidelines.

Cost/Component Reference Code

The Cost/Component Reference Code identifies the cost category or component for Site Development and Construction.

Site Development, project-level: 00-09-zzz-1-00 through 00-09-zzz-1-35

Construction-Operational Units:

Steel Structure	AA-000-00-4-00 through AA-000-00-9-35
Pipe Rack	AA-000-01-4-00 through AA-000-01-9-35
Pad	AA-000-02-4-00 through AA-000-02-7-35
Grade	AA-000-03-7-00 through AA-000-03-7-35
Equipment Items	AA-XXX-YY-2-00 through AA-XXX-YY-9-35
Plant Bulks, Buildings	AA-XXX-91-1-00 through AA-XXX-91-9-35
Operational Unit Bulks	AA-999-91-3-00 through AA-999-91-9-35
Construction-Project Level:	
Unit Substation	91-0BB-00400 through 91-0BB-00727
Main Substation	91-1BB-004000 through 91-1BB-00727
Control Center	91-20C-C0600 through 91-20C-C0635
Operations Center	91-21C-C0600 through 91-21C-C0635 only
Transmission Line	91-300-00-7-29 through 91-300-00-7-30
Elec. Hookup and Testing	91-300-00-7-31 through 91-300-00-7-33
Demobilize Project	91-450-00-0-80 only

Key:

AA Operational Unit Number

BB Substation Reference Number

CC Control or Operations Center Reference Number

XXX Assigned Number for Equipment Items, Plant Bulks (=001 if all items are grouped together. If the items are separated for detail, then this equals the Icarus system assigned number.)

YY Equipment Type System

zzz Counter: Sequential, or User-specified, for Project-level Site Development Items only

Equipment Code

The Equipment Code identifies the component. In addition, Equipment Codes can include certain non-equipment items. For items other than equipment, see "Cost/Component Reference Code" on the previous page. The Equipment Codes are as follows.

Equipment Codes

AC	01	DDT	15	HT	38	ST	54
AD	03	E	19	HU	39	STK	55
AG	72	EG	20	K	42	T	57
AT	04	EJ	21	LIN	73	TDS	58
BL	06	EL	22	M	43	TUR	71
C	07	F	24	MOT	68	TW	60
CE	09	FE	26	MX	44	VP	62
CO	10	FL	27	P	45	VS	63
CP	11	FLR	28	PAK	74	WFE	66
CR	12	FN	29	R	48	WTS	66
CRY	13	FU	70	RB	69		
CT	14	GC	32	RD	49	*OTHER*	76
D	16	GP	34	RU	50		
DC	17	HE	36	S	52		
DD	18	HO	37	SE	54		

Non-Equipment Codes

Open Steel Structure and Mill Building	00
Pipe Rack	01
Pad	02
Shell	03
None	04
Buildings	91
Area Bulks	91

Activity Codes

The codes listed below are the last 3 digits of the 10-character Activity ID.

Indirects

052 Procure Equipment
053 Procure Piping
054 Procure Civil
055 Procure Steelwork
056 Procure Instrumentation
057 Procure Electrical
058 Procure Insulation
059 Procure Paint
070 Mechanical Completion
080 Demobilize Project

Site Development

100 Site Development
101 Deliver Site Material
102 Subcontract Site Development
106 Demolition
107 Start Site Preparation
109 Piling
117 Embankments and Dikes
120 Early Site Development Complete
121 Manholes and Drains
125 Paving
129 Railroads
131 Walls and Fencing
132 Landscaping
135 Miscellaneous Site Development

Equipment Setting

200 Equipment Setting
201 Deliver Equipment
202 Subcontract Equipment
203 Field Fabricate Vessel
204 Field Fabricate Tower
205 Set Vessel in Structure
208 Pump Setting
209 Driver Setting
211 Vessel Setting
212 Tower Setting
213 Set Cooling Tower
214 Set Packaged Boiler
215 Field Erect Equipment
216 Setting Storage Tank
217 Field Erect Storage Tank
218 Turbine Setting
219 Furnace Setting
220 Reactor Setting
221 Compressor Setting
222 Heat Exchanger Setting
223 Air Cooler Setting
224 Conveyor Setting
225 Fan/Blower Setting
226 Stack/Flare Setting
227 Mill/Crusher Setting
228 Crane/Hoist Setting
229 Blender/Mixer Setting
230 Equipment Setting
231 Install Linings
232 Install Packings
235 Miscellaneous Equipment Setting
206 Set Tower in Structure
207 Set Exchanger in Structure

Piping

300 Piping Work
301 Deliver Piping Material
302 Subcontract Piping
303 Deliver Prefabricated Pipe
306 Pipe Fabrication
309 Erect Piping
317 Utility Piping
320 Buried Pipe
322 Process Ductwork
323 Steam Tracing
332 Piping System Testing
335 Miscellaneous Piping

Civil

400 Civil work
401 Deliver Civil Material
402 Subcontract Civil
404 Excavation
408 Backfill and Compact
416 Formwork and Rebar
419 Pour and Finish Concrete
425 Building Structural
426 Building Plumbing
427 Building Electrical
430 Install Precast Unit
431 Concrete Structures
433 Miscellaneous Concrete
435 Miscellaneous Civil Work
735 Miscellaneous Electrical

Steel

500 Structural Steelwork
501 Deliver Structural Steel
502 Subcontract Steelwork
504 Unload and Handle Steel
506 Erect Steel Structure
507 Erect Piperack Steel
510 Grating, Stairs, And so on
535 Miscellaneous Steelwork

Instrumentation

600 Instrumentation
601 Deliver Instruments
602 Subcontract Instruments
604 Field Instruments
605 Wire, Tubing, Junction Box
608 Control Center
632 Instrument Continuity Check
633 Control System Test
635 Miscellaneous Instrumentation

Electrical

700 Electrical Work
701 Deliver Electrical Material
701 Deliver Electrical Material
704 Install Buried Cable
706 Wire, Tray and Conduit
710 Electrical Tracing
711 Lighting and Outlets
717 Substation Equipment
721 Install Motor Control Center
727 Grounding System
729 Transmission Lines
731 Electrical Power Hook-up
732 Electrical Circuit Check
733 Electrical System Test

Insulation

800 Insulation Work

801 Deliver Insulation Material

802 Subcontract Insulation

804 Pipe Insulation

805 Equipment Insulation

810 Fireproofing

820 Acid Resistant Tile

835 Miscellaneous Insulation

Paint

900 Painting Work

901 Deliver Paint Material

902 Subcontract Painting

905 Paint Steelwork

908 Paint Equipment

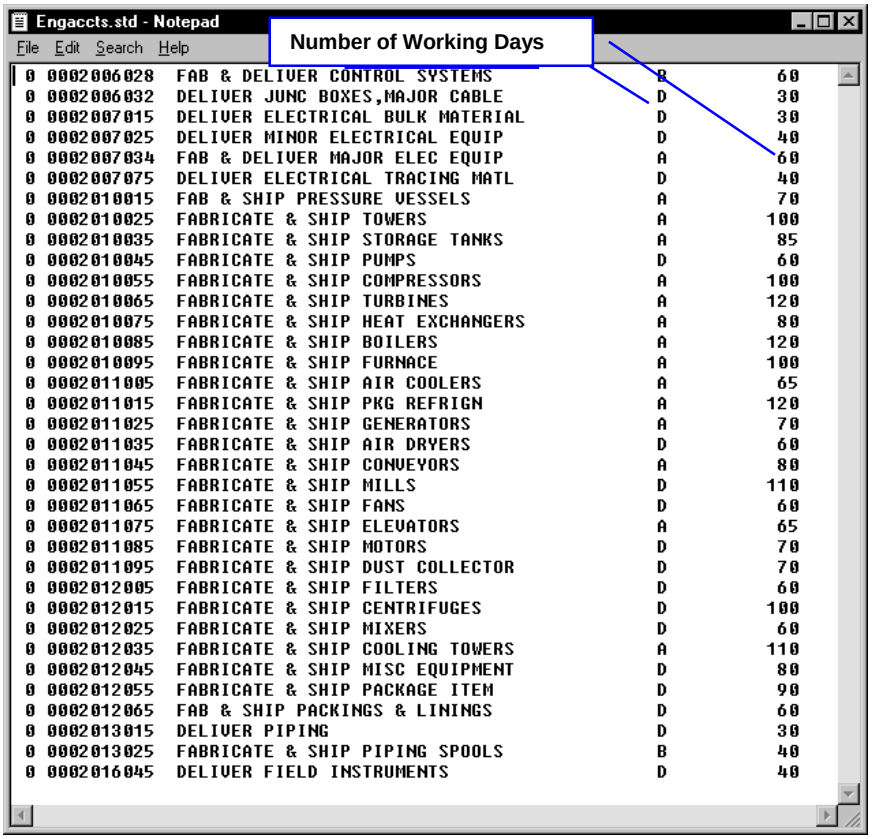
911 Paint Piping

935 Miscellaneous Painting

Defining Delivery Times

Aspen In-Plant Cost Estimator's default delivery times for equipment and materials are stored in the ASCII file **Engaccts.std**, located in the …**\Economic Evaluation V7.3\Program\Sys** folder. The default delivery times can be changed by editing this file.

Open the Engaccts.std file using Notepad or any other editor. Once the file is opened, the curve type and number of working days can be changed.

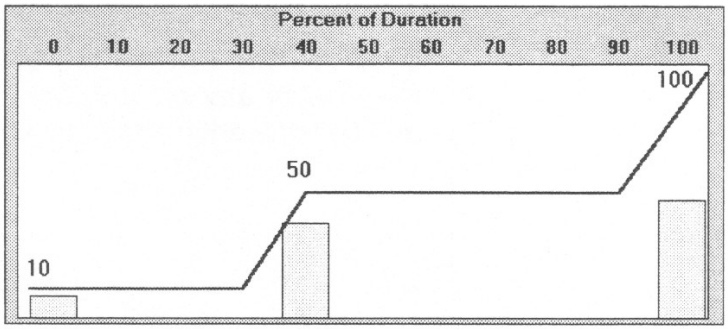

Engaccts.std - Notepad
File Edit Search Help
Number of Working Days
0 0002006028 FAB & DELIVER CONTROL SYSTEMS B 60
0 0002006032 DELIVER JUNC BOXES,MAJOR CABLE D 30
0 0002007015 DELIVER ELECTRICAL BULK MATERIAL D 30
0 0002007025 DELIVER MINOR ELECTRICAL EQUIP D 40
0 0002007034 FAB & DELIVER MAJOR ELEC EQUIP A 60
0 0002007075 DELIVER ELECTRICAL TRACING MATL D 40
0 0002010015 FAB & SHIP PRESSURE VESSELS A 70
0 0002010025 FABRICATE & SHIP TOWERS A 100
0 0002010035 FABRICATE & SHIP STORAGE TANKS A 85
0 0002010045 FABRICATE & SHIP PUMPS D 60
0 0002010055 FABRICATE & SHIP COMPRESSORS A 100
0 0002010065 FABRICATE & SHIP TURBINES A 120
0 0002010075 FABRICATE & SHIP HEAT EXCHANGERS A 80
0 0002010085 FABRICATE & SHIP BOILERS A 120
0 0002010095 FABRICATE & SHIP FURNACE A 100
0 0002011005 FABRICATE & SHIP AIR COOLERS A 65
0 0002011015 FABRICATE & SHIP PKG REFRIGN A 120
0 0002011025 FABRICATE & SHIP GENERATORS A 70
0 0002011035 FABRICATE & SHIP AIR DRYERS D 60
0 0002011045 FABRICATE & SHIP CONVEYORS A 80
0 0002011055 FABRICATE & SHIP MILLS D 110
0 0002011065 FABRICATE & SHIP FANS D 60
0 0002011075 FABRICATE & SHIP ELEVATORS A 65
0 0002011085 FABRICATE & SHIP MOTORS D 70
0 0002011095 FABRICATE & SHIP DUST COLLECTOR D 70
0 0002012005 FABRICATE & SHIP FILTERS D 60
0 0002012015 FABRICATE & SHIP CENTRIFUGES D 100
0 0002012025 FABRICATE & SHIP MIXERS D 60
0 0002012035 FABRICATE & SHIP COOLING TOWERS A 110
0 0002012045 FABRICATE & SHIP MISC EQUIPMENT D 80
0 0002012055 FABRICATE & SHIP PACKAGE ITEM D 90
0 0002012065 FAB & SHIP PACKINGS & LININGS D 60
0 0002013015 DELIVER PIPING D 30
0 0002013025 FABRICATE & SHIP PIPING SPOOLS B 40
0 0002016045 DELIVER FIELD INSTRUMENTS D 40

Note: Changing the default delivery times for equipment and materials may be just as easily accomplished within the scheduling program after the project data is brought over.

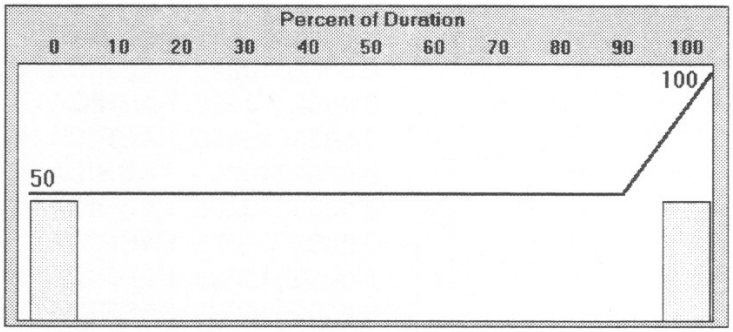
Curve Types

Curves are used to distribute resources and costs evenly across an activity. Aspen In-Plant Cost Estimator incorporates the following curves into the schedule.

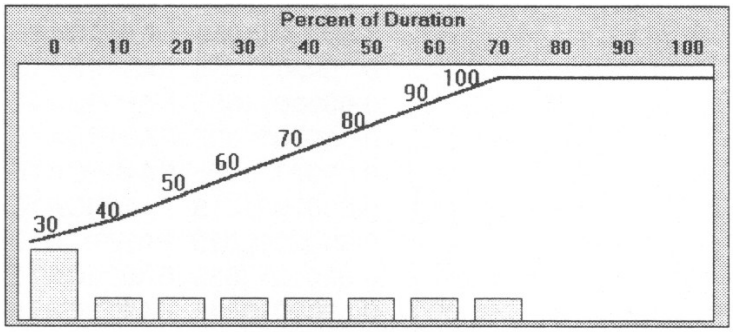
Curve A: Fabricated Equipment, Transformer



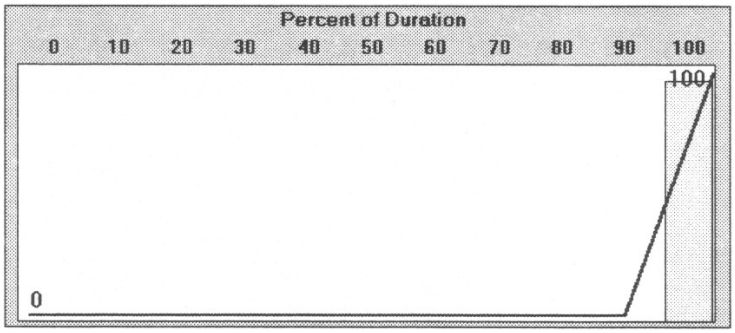
Curve B: Prefabricated Piping



Curve C: Front Loading



Curve D: On Delivery



Equipment Classes

Schedule equipment classes include the following equipment.

Equipment Class	Equipment Category Symbol	Equipment Item Symbol
Pressure Vessels	HT	All item types
	VT	JACKETED
	VT	MULTI-WALL
	VT	CYLINDER
	VT	JACKETED
Towers	DDT	All item types
	R	All item types
	TW	All except COOLING
Storage Vessels	VT	SPEROID
	VT	SPHERE
	VT	GAS HOLDER
	VT	LIGHT GAGE
	VT	CONE ROOF
	VT	LIVE BTM
Pumps	CP	All item types
	P	All item types
	GP	All item types
	VP	All item types
Compressors	AC	All item types
	GC	All item types
Turbines	TUR	All item types
	--	All turbine drivers
Heat Exchangers	HE	FLOAT-HEAD
	HE	U-TUBE
	HE	WASTE HEAT
	HE	JACKETED
Boilers	WTS	BOILER
	WTS	STM BOILER
Furnaces	FU	All item types
Electric Generators	EG	All except PORTABLE
Air Dryer	AD	All item types
Conveyor	CO	All item types
Mill	M	All item types
	CR	All item types
Fan	FN	All item types
Elevators	EL	All item types
Motors	MOT	All item types
	--	All motor drivers>250 HP

Equipment Class	Equipment Category Symbol	Equipment Item Symbol
Dust Collectors	DC	All item types
Filters	F	All item types
Centrifuge	CT	All item types
Agitators, Mixers	AG	All item types
	MX	All item types
Cooling Towers	TW	COOLING
	WTS	COOLING
Miscellaneous Equipment	CE	All item types
	CRY	All item types
	D	All item types
	E	All item types
	FLR	All item types
	CRY	All item types
	RD	All item types
	SE	All item types
	STK	All item types
	TDS	All item types
Package Items	BL	All item types
	C	All item types
	DD	All item types
	EG	PORTABLE
	EJ	All item types
	FE	All item types
	FL	All item types
	HE	CROSS-BORE
	HE	HEATER-STM
	HE	HEATER-ELC
	HE	SPIRAL PLT
	HE	SUC-HEATER
	HE	ONE-SCREW
	HE	TWO-SCREW
	HU	All item types
	K	All item types
	S	All item types
	VS	All item types
	WFE	All item types
	WTS	DEMINERAL
	WTS	SOFTENING
	--	Uncharacterized system-known
Packings, Linings	PAK	All item types
	LIN	All item types

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